

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,)
)
 Plaintiff,)
)
 vs.) No. 78 C 1004
)
OUTBOARD MARINE CORPORATION)
and MONSANTO COMPANY,)
)
 Defendants.)

The deposition of JOHN C. HENNINGSON,
called by the Defendant Outboard Marine Corporation for
examination, pursuant to notice and agreement and pur-
suant to the Rules of Civil Procedure for the United
States District Courts pertaining to the taking of
depositions, taken before Thea L. Urban, a Notary
Public in and for the County of Cook, State of
Illinois, and a Certified Shorthand Reporter of said
State, at the United States Attorney's Office, 219
South Dearborn Street, Room 1486, Chicago, Illinois
60604, on the 12th day of August, A.D. 1982, commencing
at 10:00 o'clock a.m.

PRESENT:

MR. JAMES WHITE,
(Assistant United States Attorney,
United States Attorney's Office
219 South Dearborn Street, Room 1486
Chicago, Illinois, 60604),

and

Thea L. Urban
Certified Shorthand Reporter
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312 - 782-3332

16-5v28.0/070

I N D E X

WITNESS: Direct Cross Redirect Recross

JOHN C. HENNINGSON

By Mr. Phelan	4
(Resumed)	66

E X H I B I T S

<u>Henningson-OMC Exhibit</u>	<u>Marked for ID</u>
No. 1	4
No. 2	120

- - -

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(Witness sworn.)

MR. PHELAN: Let the record show this is the deposition of J. C. Henningson, taken pursuant to notice and taken in accordance with the Rules of Civil Procedure for the United States District Courts and by agreement, the deposition has been set for today and is being taken pursuant to the Order of Judge Getzendanner, entered yesterday, August 11.

JOHN C. HENNINGSON,
called as a witness herein, having been first duly sworn,
was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PHELAN:

Q Would you state your full name for the record and spell your last name.

A John Charles Henningson, H-e-n-n-i-n-g-s-o-n.

(Henningson-OMC Deposition Exhibit
No. 1 marked for identification,
8/12/82, TLU.)

BY MR. PHELAN:

Q Mr. Henningson, I am going to show you what has been marked as Henningson Deposition Exhibit No. 1 for identification and ask you if you could please identify it for us.

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A Yes. This is the resume which was supplied to the United States Attorney or a copy of that.

Q That is a copy of your resume?

A Yes, sir.

Q Is that resume true and correct as it is reflected in those two pages, to the best of your knowledge?

A Yes, sir, to the best of my knowledge.

Q Is there anything that has been omitted or anything that is necessary to update that resume?

A No, sir.

Q Are there any other articles or lectures or seminars that you have either participated in or written before that are not included in the few-page resume?

A Yes, sir.

Q What are those?

A It is unlikely that I can recall all of them. Those would be papers I have presented regardless of when or what subject?

Q Yes. Obviously I would be interested in those relating to PCBs, but I don't know what others would be involved, so I would like to know what they are.

A Let me start most recently. ~~I was a co-author~~

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①

~~of a paper given in Oswego, New York on the dredging in the Hudson River, both the New York State DEC Hudson River Project and the maintenance dredging by the Corps of Engineers in the Lower Hudson.~~

Q Have you supplied a copy of that to the U.S. Attorney?

A No, sir.

Q ~~Would you see that he is supplied with one and then he can pass it on to us.~~

Has that been published anywhere?

A To my knowledge, it has not been published yet, but it will be published.

Q Where?

A In the proceedings of that seminar, the exact title I don't remember, by the USGS and the New York State Department of Conservation.

Q Any other papers, speeches or seminars that you are involved in?

A I really wasn't prepared to recall all of these, so I will just tell you what I remember.

Q I know we are going to see you again, so maybe the easiest thing to do is to supply us in the interim with ~~a complete list of all your writings and your speeches and any other papers that you have given.~~

2.

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If you have copies of them, then you can supply us with those as well, and then by the time we see you again, we can have reviewed and if we have any questions about them, we can ask you then.

Fair enough?

A Does this include when you say other activities, I have -- all projects I have worked on are not listed here. This is a selected list of projects, so there are reports I have had input in in ten years as working as environmental consultant. What is the extent --

MR. WHITE: He is talking about published writings.

BY MR. PHELAN:

Q Published writings, not the work you have done.

If you have given a speech someplace and there is a record of the speech, I would like to know that.

A All right.

Q But I am talking about your extracurricular activities now, namely, your speeches, writings, attendance at seminars. We will talk a little bit more about your work product as we go along.

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Are you clear now what I would like?

A Yes.

Q If you do that, give that to Mr. Hynes and Mr. White and they can then give it to us and we will review it before we meet again.

Let me just pass over your background just a little bit.

How old a person are you?

A 38.

Q Where were you born?

A Watervilet, New York.

Q You have a degree from the State University of New York. Which branch is that? Is that Oswego?

A No, sir. My Bachelor of Science or Bachelor of Arts Degree is actually Syracuse University. I attended the State University of New York, College of Forestry for several years and then I switched over to the School of Education at Syracuse University and finished up at Syracuse University with the Bachelor of Arts.

Q That is in biology?

A Biology option in the School of Education, yes, sir.

Q Just give me a little idea. You took General

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Forestry at SUNY College of Forestry and that is located at?

A Syracuse.

Q Then?

A They are located, co-located on the Syracuse campus. One is a State school, but they are both located.

Q You were degreed in 1966?

A That is correct.

Q How much time did you spend in the Forestry school?

A Three semesters.

Q Then you went directly from there to graduate school, Animal Ecology at SUNY, Oswego?

A No, sir. I was teaching Biology in Liverpool, New York and took those graduate courses in the summer, so I did not go directly into a graduate program. Those were summer courses.

Q I am sorry. You took summer courses at SUNY while you were teaching?

A Yes.

Q You were teaching where?

A At Liverpool High School, Liverpool, New York.

Q Is that spelled like Liverpool, England?

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A Yes, sir.

Q When did you begin studying for your Master's Degree in Environmental Engineering at Rensselaer?

A In May of 1971. It may have been June. I got out of the Army in May, I guess, and there were a few weeks, so I guess it was actually June.

Q How long a course was that?

A I completed the courses in the Summer of '72 and began working in the Fall of '72, still working on my thesis. So I did not actually get my degree until Spring of '73.

Q What was your thesis on?

A It was on the distribution of benthic invertebrates, macroinvertebrates in several Bays of Lake George, New York.

Q Macroinvertebrates?

A Yes, sir.

Q Is that somewhere else?

A That is as a water quality trainee, conducting field surveys and toxic bioassays to determine the effects of outboard motor exhaust products.

(Brief interruption by the
court reporter.)

BY MR. PHELAN:

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Q If you will just articulate a little slower, I think it will be easier for all of us.

Let me go back here so Ms. Urban has everything that you just said.

You referred to this in describing --

A Yes, the work that is done is described in my resume as activities while I was a Water Quality Trainee at Rensselaer Polytechnic Institute. And the question you asked, macroinvertebrates?

Q Yes, but hold on, just before you get into that; didn't you mention something about Outboard Marine?

A Outboard motor exhaust products.

Q Then you received your degree from Rensselaer Polytechnic Institute in the Spring of '73?

A Yes, sir.

Q Did you matriculate right from high school to college in 1963?

A I graduated from high school in '62 and started that Fall, in the Fall of '62, yes, sir.

Q You show General Forestry '63 to '64.

A Oh. Actually I went to Syracuse College of Engineering, School of Engineering for one semester and transferred to College of Forestry.

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Q So this is incorrect. It should have showed Syracuse University '62 to '63?

A '62 to January '63, yes, sir. That is a full record of attendance.

Q I assume that during school you held jobs during the summertime?

A Yes, sir.

Q Were those the typical summer jobs?

A Yes.

Q Were any of them involved in environmental work?

A No, they were not involved in environmental work.

Q So your first full-time job then began in 1966. That is when you went to Liverpool High School?

A Yes, sir.

Q You served in Viet Nam?

A Yes, sir.

Q You mentioned you started in '71 at Rensselaer.

A Yes, sir.

Q Now, the Water Quality Trainee, was that part of your courses at Rensselaer that you were to be a Water Quality Trainee?

A That title is derived from the financial

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support that I was receiving in part for the research that I was conducting.

Q Towards your tuition?

A Yes, sir.

Q Was this your first experience in taking samples?

A No, sir.

Q Did you do that while you were at the College of Forestry and your biology course?

A Yes, both at the College of Forestry and when I was in the summer program at SUNY. Both involved considerable field work.

Q Both involved taking samples of sediments, water, fish?

A Yes.

Q Split samples?

A Not always split samples, no, sir.

Q Were you trained for that work while you were at SUNY, sampling and assaying and so forth?

A The courses were basically field ecology courses giving procedures for sampling, yes, sir.

Q Macroinvertebrates are what type of animal?

A They are, I guess you would say the readily observable invertebrate life that generally lives on

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the bottom of lakes and streams.

Q Readily observable. Could you give me an example?

A Well, a worm, an insect larva, snail as opposed to possibly a nematode that would be very small or bacteria.

Q Is a snail darter a macroinvertebrate?

A No, that is an invertebrate. It is a fish.

Q Over what period of time did you conduct these field surveys and toxic bioassays?

A I believe the first samples I collected were in February of '72 and the last one in September of '72, so the attempt would cover all seasons, although not a full year's data.

Q That formed a major part of your thesis for your Master's Degree?

A Yes, sir.

Q Just tell me briefly what kind of conclusions if any you reached in that thesis.

A Well, it actually was two parts and the field sampling was the major part where there was an ongoing study to determine whether the oil exhausted from operating outboard motors was having any effect on the water quality of Lake George, not only the water

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quality, but did it have a tendency to reside in the sediments or water column or did it volatilize, whatever.

My role was to see if I could find any distinctive difference between the macroinvertebrate population in three bays which might be an indicator that there was an impact.

One of the bays was heavily used by outboard motor traffic. The other bays were not intensively used by outboard motors, so it was to attempt using diversity indices and total numbers and so on to see if there was a difference which might then indicate an impact by outboard motor usage.

Q Did you conduct most of these studies or all of these studies by yourself?

A I was working under a mentor at that time and I was assisted at the time by people in collecting the samples, but the majority of the work was done by myself physically.

Q What conclusions if any did you reach after your investigation of the samples from the three bays in Lake George?

A That there were no distinctive differences that could not be accounted for by differences in the

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bottom characteristics, cover material, weeds and depth and other factors other than outboard motor exhaust.

Q Did your thesis suggest any other study be done?

A I believe so, yes, sir, but I don't remember clearly what way.

✓ Q When you gather together the extracurricular writings, would you include a copy of your thesis?

A Yes, sir.

Q You completed your course work in 1972 at Rensselaer?

A Yes, sir.

Q Then you began your work at Ebasco in New York City?

A Yes, sir.

Q In reviewing again your work with Ebasco, on all of the projects that you have listed in Henningson Deposition Exhibit No. 1, did you work on those projects with other folks?

A Yes, sir.

Q Were you cast kind of in a role of junior environmental engineer?

A Yes, sir, engineer and scientist.

Q There is a term that you have used in your

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resume: Benthic. Can you tell me how that term is used in relation to the other descriptions of the work you did?

MR. WHITE: Do you understand the question?

BY MR. PHELAN:

Q Tell me how you used the word benthic here.

A Yes, sir. In looking at this resume, I would say that that is a spelling. It should say benthos.

Q How did you use it in connection with the description of work you did?

A Let me see if I understand the question, sir. For that particular project, Trinity Bay, Texas, what was the work that I did?

Q Yes. You have used the term. I can look it up in the dictionary, but --

A That means the bottom living organisms.

Q That is the way you use it here?

A Yes, sir.

Q Would that include sedimentary life?

A I don't understand what sedimentary life is.

Q Yes, I just invented the term.

Do I understand you to mean that benthos would include bottom living organisms? Would that

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include organisms that actually reside in and live in the sediment?

A Yes, sir.

Q Would that also include living organisms living on top of the sediment?

A Yes, sir.

Q There are some organisms, are there not, that actually live within the sediment and never leave the sediment?

A Few organisms ever exist wholly within the sediment. There is some life stage where they may be in the water column, eggs or whatever, floating in the water column. They are most easily identified, however, by what their most observable life stage is.

Q Wherever we see benthic here, that should be substituted then to benthos? You have used it a couple of times.

A No, sir. Only the first time, that should be an evaluation of benthos.

The second time under St. Lucia Inlet, that should be benthic data. That is correct as it was intended.

Q Benthos is the noun and benthic is the adjective?

A Yes, sir.

Q The evaluation of the Potomac River water plant and the estuary, was there a contemplated discharge directly into the river there?

A Yes, sir.

Q What was the temperature of the water that was being discharged into the Potomac River?

A I don't recall, sir.

Q The St. Lucia, Florida evaluation of benthic data to assess the impact of dredging operations for an offshore cooling water discharge, maybe you might explain to me what exactly the conditions were that you were attempting to analyze that would be created by dredging and how that related to these bottom living organisms.

A This was part of an impact assessment for that proposed power plant.

The question I was asked to research was after you dredged and disturbed the bottom population, would that disturbance remain for a long time or would it be repopulated at some rapid or slow rate.

Q What did you conclude, if anything?

A That it would be repopulated and that the rate was difficult to predict without knowing the exact

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conditions under which the dredging occurred and having more specific information, but there was every reason to believe it would be repopulated.

Q Evaluation of the benthos relative to the alleged thermal pollution of an estuary, is that in Trinity Bay?

A Yes, sir.

Q What if anything did you find out there? Was there going to be an impact?

A I don't recall, sir, that particularly, that particular project.

Q You left there in '73?

A Yes, sir.

Q Is that before or after your degree?

A I had received my degree at that time.

Q What was the reason you left Ebasco, better pay?

A No.

Q More opportunity?

A Well, maybe I should say all of the above: Better pay, more opportunity and also an opportunity not to have to commute to the city every day which may have been the biggest weighting factor.

Q Malcolm Pirnie is in where, White Plains?

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A White Plains, yes.

Q Since you have been with Malcolm Pirnie now for almost nine years --

A It will be ten years this Fall. I'm sorry, it will be nine years this Fall.

Q You list the registration as a certified ecologist.

A Yes.

Q Who is the certifying body?

A The Ecological Society of America.

Q Is that by invitation only?

A The certification process is, you supply your credentials to a board of peers and they evaluate your credentials and make a decision based on that.

Q You are admitted on qualification?

A Yes, sir.

Q You are a member of the American Society of Civil Engineers?

A Yes, sir.

Q Are you a civil engineer?

A No, sir.

Q You talk about the Ecological Society of America and the American Society of Limnology and Oceanography.

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A Yes, sir.

Q Can you tell us what limnology is?

A Limnology?

Q Pardon me.

A That is, I guess you'd relate it to the ecology of fresh water lakes, basically, lakes and streams as opposed to oceanography which is a marine activity.

Q The study of fresh water lakes?

A Fresh water lakes and streams and rivers.

I would like to come back with regard to the American Society of Civil Engineers. I would like to verify that I am not a registered engineer though I have engineering training.

Q Have you sat for any of the examinations?

A Yes, sir.

Q Have you passed the exam?

A No, sir.

Q Are you reapplying?

A Yes.

Q When did you last sit for a civil engineering exam?

A I believe it was October of last year.

Q '81?

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A Yes.

Q How many times have you taken the exam?

A Twice.

Q October of '81 and --

A April of '81, I believe.

Q Are those New York exams?

A Yes, sir.

Q The summary of experience, does that include everything from the time you began school in '62 up to and including the present time? Does that just relate to Malcolm Pirnie?

A The summary, this includes what was considered pertinent information in this resume at the time it was prepared. It was not prepared specifically for this activity.

Q Was this --

A There may be things missing that may have been of interest to you.

Q This was prepared for use by clients?

A As a marketing item to possibly describe my qualifications.

Q Let's see if we can go back.

You started with Malcolm Pirnie almost ten years ago?

A Yes, sir.

Q In New York as an environmental analyst?

A Yes, sir.

Q As an environmental analyst, you seem to have focused on or your work seems to have been concentrated in water, wastewater treatment facilities, potable water treatment plants and sewer and regional interceptors.

How long did you spend just doing that type of environmental work?

A I don't remember precisely how long I held that title, but the firm's focus on water and wastewater, I think, was clearly -- well, we still have a lot of work in that area, so I would say I continue to have those kinds of activities that I am involved in.

Q Did you as an analyst confine yourself to those areas? Is that all you did?

A That is a summary of the kinds of projects that I was involved with in that duration for several years, though I don't remember precisely how long.

Q How do you at Malcolm Pirnie distinguish between wastewater treatment and potable water treatment?

A Wastewater treatment would be treatment of

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water prior to discharge into a water body as opposed to potable treatment which is treatment after withdrawal for use by human consumption.

Q Chicago's filtration plant, would you qualify for the latter?

A Yes, sir.

Q Did you ever work on the storm sewer interceptors here in Chicago, the Metropolitan Sanitary District?

A To the best of my knowledge, no, sir.

Q Do you know about that?

A Yes, sir.

Q You don't know how long you were an environmental analyst?

A I don't remember precisely, sir.

Q Then you moved up to senior environmental analyst?

A Yes, sir.

Q Channel maintenance dredging, tell me about your experience in channel maintenance dredging.

A I believe this was the preparation of an environmental impact analysis for the New York State Department of Conservation, environmental conservation for the removal of sediments breaking the Fort Edward

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Channel, Fort Edward, New York.

Q Did you draft a plan for dredging?

A No, sir. My role was the evaluation of engineering plans to dredge.

Q Have you ever directed a dredging operation?

A No, sir.

Q Have you observed one?

A Yes, sir.

Q You use the term channel there. Is that to distinguish it from harbor?

A That wasn't the purpose or the intention here to make that specific distinction.

Q Have you done any harbor maintenance dredging?

A I have not been responsible for dredging, no, sir.

Q You show industrial site evaluations and environmental specifications for regional wastewater interceptors and treatment facilities.

A Yes.

Q I assume they go hand in hand?

A No, sir.

Q They do not? Tell me what you mean.

A The industrial site evaluations were for either the expansion of an existing industrial facility

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or in another case, was the evaluation of the site for a new industrial facility, and in a third case, it was the evaluation of an existing industry that would be acquired by another industry.

Q When were you promoted or if you had an advance from environmental analyst to manager?

A That was in January of '78, I believe.

Q You became a manager 1 of '78.

Now, in connection with your environmental impact statements for the dredging of the Lower Hudson River, again, you evaluated and analyzed the plans of the corporation?

A Yes.

Q Did you observe any of that maintenance dredging?

A No, sir. I was never on the site during active dredging. I was at the site where dredging occurred, the disposal areas, but I was not there during the act of dredging.

Q That dredging was done simply for navigational purposes?

A Yes, sir.

Q The Peekskill Resource Recovery Facility for Westchester, New York, again, was that for navigational

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purposes?

A No, sir.

Q What was that done for?

A That is not a dredging project. That is a facility to derive electricity and possibly steam from garbage.

Q Is that actually operating?

A No, sir.

Q Is it under construction?

A Yes, sir.

Q You directed the environmental analyses for facility planning in Zarqa and Rusiefa. Is that in --

A They are both in Jordan.

Q I see. What was the facility's plan for the two bases in Jordan and Suez?

A The facilities undergoing planning were wastewater collection and treatment, water supply and storm water drainage control.

Q When did you become vice president?

A January of '81.

Q You list here supervision of evaluation of projects such as removal and disposal of hazardous wastes.

Can you give me some examples of the

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supervision of evaluation of projects for removal and disposal of hazardous wastes?

A A number of projects are for clients who I must keep confidential, but I can give you examples as to the nature of the project. The geologists who are responsible to me have evaluated the impact of the disposal of trichloroethylene on groundwater in the State of New Jersey.

They have evaluated the leakage of industrial wastes of various types from lagoons in Massachusetts and Connecticut.

Q I am sorry. What was the material?

A Various industrial materials.

Q From lagoons?

A From lagoons.

They have evaluated the contamination of soil during a transformer cracking in the metal reclamation process, so that would be PCB contamination.

Of course, there is the Upper Hudson River restoration which involves PCBs.

There is a landfill project that we just completed for the New York State Department of Transportation which was an alleged toxic waste landfill which we did groundwater and other studies on.

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Generally they have been the determination of ground-water as a result of disposal practices.

Q How many hazardous waste disposal projects have you been involved in with Malcolm Pirnie?

A It's probably over a dozen of various aspects of hazardous waste projects. I don't know the precise number.

There are also quite a list of industrial waste projects that might not be hazardous by definition, but had similar precautions.

Q Did any of those projects involve dredging?

A Two have involved dredging, as I recall -- three that come to mind immediately.

I am responsible for an environmental evaluation of PCB-contaminated sediments in the Acushnet Estuary in Bedford, Massachusetts. That is for the DEQE, Department of Environmental Quality Engineering, State of Massachusetts.

Q Where is the Bedford, Mass., the Acushnet Estuary located with respect to Boston?

A Just south of Boston, I believe.

MR. WHITE: About 20 miles south of Boston.

BY MR. PHELAN:

Q At what stage is that at?

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Henningson - direct

A That is in a feasibility study.

Q Have you rendered a written report in connection with that?

A A draft report, yes, sir, but that has been rendered.

Q Have you concluded that it is feasible to dredge?

A We presented several alternatives. There was additional data which had not been available and which has now been made available to us which will affect our thinking and we have not come up with a final conclusion yet.

Q What is the amount of PCBs that you believe are in the Acushnet Estuary in Bedford, Mass.?

A We did make an estimate. I don't recall the precise number.

Q Can you give me an estimate? Was it more than 100,000 pounds?

A I really don't recall, sir. I can get you a number, but I don't recall.

Q Was it more than a million?

A I don't think it was more than a million, no, sir.

Q What is the alleged source of these PCBs?

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A I don't have the information available to me to conclusively determine that. I think there are several possible sources and one that comes to mind is a firm called Aercvox. There is another firm that was identified. I don't remember their name.

Q Do these person or persons own or operate property immediately adjacent to the estuary?

A That is my understanding, yes, sir.

Q Was the amount of PCBs allegedly in the estuary determined on some grid system or by some grid system?

A We did not have a role in determining the data-gathering process. There were a variety of organizations collecting data and we evaluated that data. Some of it was on a grid system, some of it was not. There are various sources of data.

Q Is that draft report in your opinion confidential?

A No, sir.

Q You would make that available to Mr. White?

A Yes, sir.

Q That is one of three projects. Are there any others?

A The Environmental Impact Statement for the

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Corps of Engineers, their 10-year maintenance dredging plan for the Lower Hudson recognized that there was PCB contamination in the Upper Hudson and they might have to locate disposal sites which would be able to handle hazardous materials.

Q For the Lower Hudson?

A For the Lower Hudson if substantial materials washed downstream, so as part of our evaluation, we identified sites that might be suitable for hazardous disposal in the Lower Hudson.

Q Has that reached a point where you have given a draft?

A Yes, sir.

Q Would you include that with the same materials?

A Yes, sir.

Q I think you mentioned --

A Sir, that report has been rendered as a draft. That one, I presume it can be released, but I will have to check with the client.

Q The client there is the New York Department --

A The client is New York District Corps of Engineers.

Q Finally, you mention one other.

A Well, the set of PCB studies done on the

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Upper Hudson including the environmental impact statement for the State Environmental Quality Review Act.

Q That I assume is not confidential?

A No, sir.

Q Would you be good enough to ship those three documents including all of the --

A I would clarify in that case specifically, I was not the project officer from Malcolm Pirnie. We have a matrix management system and the technical people working on this project were under my administrative responsibility and I had technical input. There was another person, officer in the firm who was in total charge of that input.

Q Does that cover then the experience that you had with either the treatment, removal, transportation or containment of PCBs?

A I'm sure other things will come to mind. I am currently working for the Corps of Engineers at New York Harbor on the potential use of dredged material as cover for landfill. The question of contamination by PCB and other materials came up some in many of the projects I am involved in: The Hudson. It involves that kind of analysis. If I thought long enough, I'm sure I might come up with others.

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Q You have the Lower and Upper Hudson and you have the Bedford, Massachusetts Estuary?

A Yes, sir, and the work out in Western New York on the cracking transformers and correction of the metal that was involved in that.

Q Were there allegedly PCBs in that?

A Yes, sir.

Q Would you include that one also?

A I have had input into that, but once again, sir, I was not the project manager on that.

Q Why don't you simply note that you had input but you were not the project officer.

A Yes, sir.

Q In any of the other projects that you have contained in your summary of experience, were there industrial wastes that included PCBs?

A It's certainly possible.

Q For example, you list a nuclear and fossil-fuel electric power plant. With any of those, were PCBs discharged?

A To my recollection, no.

Q Are you familiar with the methods of determining the existence of PCBs in sediments?

A In a general way, yes, sir.

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Q Have you actually used and observed those instruments in their actual use?

A I have observed their use, yes, sir.

Q Have you ever done it yourself?

A No, sir.

Q In your opinion, what is the latest state of the art method of identifying PCBs in sediments?

A I presume you are talking about analytical techniques rather than the actual collection.

Q The sampling, I think you have already discussed that.

A I am an expert in this area.

Q For example, sampling for PCBs is the same as sampling for anything in water, isn't it?

A The collection of the sample, yes, sir.

Q Those follow certain prescribed standards. What I am interested in is your knowledge of the analytical methods of determining the existence of PCBs.

A I don't consider myself an expert in that area. I am familiar with the methods that are used and there are a variety of them and there is some dispute about that and how much cost one should spend in analysis.

There are quick and dirty methods. There

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are easy methods and it depends on the purpose of the study, but I don't consider myself an expert in that area.

Q What is the most reliable method of determining the existence of PCBs, in your view?

MR. WHITE: You are asking for his personal opinion now as opposed to his professional opinion?

BY THE WITNESS:

A Well, the method I am most familiar with is gas chromatography.

BY MR. PHELAN:

Q Do you consider that a reliable method?

A For most of the purposes I have been involved in and depending upon the level of concentration you are looking for, it is a reliable method, yes, sir, realizing there are variabilities inherent in analyses that can vary several-fold from one sample to another, given to two different laboratories, so there is quite a bit of variability in the results.

Q Have you ever operated a gas chromatograph?

A No, sir.

Q Have you ever observed one being operated?

A Yes, sir.

Q Have you ever drawn any samples that were

ever analyzed through a gas chromatograph?

MR. WHITE: Personally or caused to be?

MR. PHELAN: No, personally.

BY THE WITNESS:

A Not to my knowledge, no, sir.

BY MR. PHELAN:

Q Have you ever directed a study of where samples should be taken of PCBs for the purpose of analyzing by gas chromatograph?

A To my knowledge, not where the sole purpose was the detection of PCBs, but PCBs were a constituent among many that were analyzed, yes, I have.

MR. PHELAN: Let's take a five-minute break here.

(Brief recess had.)

BY MR. PHELAN:

Q Reserving on the questions that you are going to supply us the information on, Mr. Henningson, which include your speeches and presentation of papers and your thesis as well as the PCB studies, we will move on to another area.

When did you first become involved in the U.S. Attorney-Outboard Marine-Waukegan Harbor Project?

A I had some involvement in 1979. We submitted a proposal to the U.S. EPA to do technical studies for

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the U.S. EPA.

Q For the Harbor?

A For whatever was involved in that study.

Q Tell me about that.

A Well, at that time we knew very little about it. I knew particularly little about, about the specific characteristics of Waukegan, only that there was PCB contamination and evaluation of technical alternatives to remediate that condition if necessary or where requested.

Q What if anything did Malcolm Pirnie do?

A We did not work for the U.S. EPA at that time. We submitted a proposal, that's all.

Q To do the work?

A Yes, sir.

Q Was that rejected?

A We could not come to a contractual agreement with the U.S. EPA.

Q Do you have a copy of that proposal?

A I presume there is one back in our office in White Plains.

Q Could you supply that to Mr. White?

A Yes, sir.

Q Perhaps you could just tell us briefly: What

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did you propose?

A I don't believe it was a very extensive proposal at all and my recollection is not clear other than to provide engineering services to evaluate alternatives to remediate the contamination of Waukegan Harbor.

Q Was that in response to a request by the EPA or by bidders on that job?

A Of that I'm not clear, sir.

Q In any event, Malcolm Pirnie did submit a proposal?

A Yes, sir.

Q That was not accepted by the U.S. EPA?

A No, that is not the case.

Q You didn't accept EPA?

A Yes, sir.

Q Is that because they didn't pay your bills on time?

A No, that wasn't the reason.

Q What was the reason?

A A variety of financial factors: Overhead, profit levels and so on, level of effort that we might have believed was necessary.

Q You mean they were too cheap?

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A Yes -- just could not reach an accommodation.

Q Could you tell me specifically why you could not reach an accommodation?

A I don't recall one specific reason. I believe it was this discrepancy in what we believed was our allowable overhead, a discrepancy in what we believed or disagreement, I should say, in what we believed to be an acceptable level of profit.

Those come clearly to mind.

Q Did you have any discussions with anyone at U.S. EPA yourself?

A I don't believe I did, no, sir.

Q Who was the person who discussed this matter with the EPA in 1979?

A I believe it was Richard Thomas.

Q What is his position with Malcolm Pirnie?

A He was a manager at that time. He is no longer with Malcolm Pirnie.

Q Where is he?

A He is an employee of Gahagean & Bryant Associates.

Q Do you want to spell that?

A I'll do my best: G-a-h-a-g-e-a-n ampersand B-r-y-a-n-t, Associates.

Q Are they environmental engineers?

A No, sir. They are dredging consultants.

Q Did his leaving have anything to do with the EPA proposal?

A To the best of my knowledge, no, sir.

Q What if anything did you do on that proposal?

A I really find it is difficult to explain without having the proposal in front of me.

Q So the next time you come back, you will have at least reviewed the proposal and you and I can discuss it in some detail?

A Yes, sir.

Q When was your next contact with, let's call it the Waukegan Harbor Project?

A I believe it was in April of this year. I received a call which may have initially been directed to Mr. Thomas, I don't recall precisely, from Sandra Gardebring.

Q Did you know Sandra?

A No, sir. Do I know her now or did I know her then?

Q Did you?

A Not prior to that phone call, no, sir.

Q What did Sandra Gardebring tell you and what

did you tell her in that telephone conversation?

A All that I can recollect is that she wanted to know if we had an interest in assisting them in evaluating technical work on Waukegan Harbor engineering environmental studies. I don't remember anything more precise than that.

Q And you said you did?

A I said we did have an interest in working in that area, yes.

Q Provided it wasn't with the EPA?

A I indicated that we had some concern, I thought that that should be clarified before we went much further, yes, sir.

Q Anything else discussed?

A No. It was a very brief call as I remember, just an expression of interest on our part.

Q What was the next contact if any you had with the EPA or the U.S. Attorney on Waukegan Harbor?

MR. WHITE: Which do you want first? Do you want to talk about EPA?

MR. PHELAN: No, let's use the Waukegan Harbor Project.

MR. WHITE: What is the question?

BY MR. PHELAN:

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Q What is your next contact re the Waukegan Harbor Project?

MR. WHITE: With whom now?

MR. PHELAN: With anybody.

BY THE WITNESS:

A Outside Malcolm Pirnie or inside Malcolm Pirnie?

BY MR. PHELAN:

Q No, you at Malcolm Pirnie. What was your next contact re Waukegan Harbor? You took the call from Sandra Gardebring. You discussed it and you said you had an interest.

What happened next?

A We discussed it internally among ourselves as to our previously submitted proposal and the difficulties and how we might find a way of providing assistance.

Q And?

A There may have been another phone call from Sandra, between Sandra and I. Who called whom, I'm kind of hard to get on the phone and oftentimes I am returning calls when they are initiated from the other end, but there may have been another intervening call in which I suggested that maybe one way of maybe

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simplifying this was could we work directly with the U.S. Attorney when it became apparent that the U.S. Attorney was involved and that might eliminate some of the difficulty and/or contractual arrangements with the U.S. EPA.

This may have occurred in the first phone call. I can't remember if there was one or two.

Q What next happened after that?

A The next call was a discussion with the U.S. Attorney, the U.S. Attorney's Office, about working --

Q Here in Chicago?

A Here in Chicago, yes, sir.

Q When did that meeting take place?

A We had a meeting in April. I don't remember the precise date. I believe it was somewhere towards the end of April.

Q Where was the meeting?

A In this building.

Q Who was present at the meeting?

A My recollection, I briefly met Sandra Gardebring and then I sat down with Jim White and Jim Hynes and Kaye.

MR. WHITE: Kaye Jacobs.

BY THE WITNESS:

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A I don't believe there was anyone else present at the meeting -- oh, Dick Brownell was with me at the meeting.

BY MR. PHELAN:

Q Can you give me the approximate date of that meeting?

A My recollection was about, around the 23rd or 24th of April.

Q That I assume is verifiable, that date?

A Yes.

Q That will be in your bill to the Government?

A Yes, sir, it already is. I believe --

MR. WHITE: They have already been paid.

THE WITNESS: That's right.

MR. WHITE: That's right.

BY MR. PHELAN:

Q Would you check that date on your documents?

A Yes, sir.

Q As a matter of fact, why don't you just send your bills to them again and they can send us a copy. That would be easier.

MR. WHITE: We will get you the date.

BY MR. PHELAN:

Q Just tell us generally the content of that

meeting. First, how long did the meeting take?

A I seem to recall it was about a two-hour meeting roughly.

Q Did it take place here on the 14th Floor of the Federal Building?

A Yes, sir.

Q Just tell us generally what was discussed.

A We were given a brief overview of the nature of the Waukegan problem as perceived by the EPA and the U.S. Attorney. By that I mean there was contamination, where it was and maps and photos just to make us familiar with the situation in a broad way.

We discussed, could we provide and what kind of technical support could we provide to look at engineering alternatives and the environmental implication of those alternatives and the response time necessary to provide that assistance.

Q Tell us generally what if anything you decided to do or not to do at that meeting?

A My recollection is we promised to get back to the U.S. Attorney's Office in a few days and give them a verbal idea of the kinds of things that we would undertake and a schedule for how long it would take to undertake them.

or something of that case, so it was a brainstorming study.

Q You are not suggesting it is unscientific?

A Ours was not the collection of scientific data. Ours was more an engineering study and to what extent does the environmental data previously collected lead us to a certain approach. So no, I am not suggesting it is an unscientific study.

Q Did you and Mr. Brownell then review the material you thought appropriate?

A That information, we asked for all pertinent information from the U.S. Attorney. We reviewed that which was supplied to us and formulated some general concepts, began with some general concepts of action.

I think at that time, we felt that we were pretty certain that no-action was not an appropriate course, after the first two weeks.

Q After the first two weeks?

A Yes, sir.

Q What did you read after the first two weeks that led you to that conclusion?

A The extent of contamination in the sediments and its distribution.

Q Can I stop you there?

A Yes, sir.

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Q What report or reports did you rely on for that conclusion?

A Through, it is really an assimilation of data and information from a vast array of reports, which you have a list of what was supplied to us. And I believe I have read at least at one time, each one of those reports. So to precisely say what it was, whether it was this piece of information that reflected my judgment, it is very difficult.

If you were to ask me on a specific report, I would be more comfortable to respond in that way.

Q Let me ask you this: Was there anything in that data, that information that you read in the two or three weeks which led you to the opinion that a reasonable and scientific reliable study had established that there were 100,000 to a million pounds of PCBs in Waukegan Harbor?

A I can't respond to those precise numbers, but I felt there was enough certainty in the reports and the information I reviewed that there was hundreds of thousands of pounds of PCB in the vicinity in the OMC Plant.

Q My question is now you said you concluded there

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were hundreds of thousands of pounds of PCBs.

A Based on available information.

Q What reasonable and scientific study did you base that on?

A The data presented and summarized in the Mason and Hanger reports; the data presented in the JRB report where good basic summaries of the information are available.

Q Did you consider those studies to be a reasonable and reliable scientific analysis of the amount of PCBs in the Harbor?

MR. WHITE: In the Harbor, only in the Harbor?

BY THE WITNESS:

A In the Harbor? I am talking about the overall problem.

BY MR. PHELAN:

Q Let us start with the Harbor and we will then discuss the North Ditch and Upland.

A As a basis for my judgment?

Q Yes.

A That there were substantial contamination in the sediments in the Harbor, yes, sir.

Q What study was that, the Mason and Hanger study?

A The Mason and Hanger study and report and the other studies which were summarized in there which I also reviewed independently as well. The data base, as you know much better than I, is a collection of data of various sources and for me to enumerate each one at this point --

Q I just want to know what led you to this conclusion early on, but it was the material as contained in the Mason and Hanger reports and these were referred to?

A That is one major source of data, yes, sir.

Q What are the other major sources?

A Once again, much of that information and other information is in the Hydroqual modeling report which I relied upon quite a bit as an information document; the basic modeling and sampling done in the Argonne -- there were a number of fish sampling reports that were just sheets from the State and the EPA that we had at that time. I really cannot separate, and maybe if I looked through the order of these --

Q Go ahead.

A -- documents, they are really more or less the order that we received them. So it is easy to get carried away and start referencing things that maybe

we didn't have in those first two weeks.

Q Maybe we can save time. Maybe we can adjourn for lunch now and you can take a look at that and you can come back and Ms. Urban will give you a question back again and you can give me the bases of which you came to the conclusion that early on the no-action remedy was not appropriate.

MR. WHITE: That wasn't the question.

MR. PHELAN: No, the question was the extent of contamination of PCBs. What was the scientific study on which you based that opinion.

MR. WHITE: That is the question that is pending?

MR. PHELAN: That is the question that is pending.

(At 12:10 o'clock p.m., a lunch recess was taken to 1:10 o'clock p.m., this same day.)

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,)	
)	
Plaintiff,)	
)	
vs.)	No. 78 C 1004
)	
OUTBOARD MARINE CORPORATION)	
and MONSANTO COMPANY,)	
)	
Defendants.)	

August 12, 1982,

1:10 o'clock p.m.

The deposition of JOHN C. HENNINGSON
resumed pursuant to noon recess at 219 South Dearborn
Street, Room 1486, Chicago, Illinois, before Thea
L. Urban.

PRESENT:

MR. JAMES WHITE,
MR. JERROLD H. FRUMM,
MR. RICHARD J. PHELAN,
MS. ROSEANN OLIVER,
MR. RICHARD J. KISSEL,
MR. JEFFREY C. FORT,
MR. JAMES H. SCHINK,
MR. BRUCE A. FEATHERSTONE,
MR. JOHN VAN VRANKEN.

ALSO PRESENT:

MR. HUGH THOMAS .

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JOHN C. HENNINGSON,

called as a witness herein, having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Resumed)

BY MR. PHELAN:

Q Have you done your homework over the noon hour, Mr. Henningson?

A I have done some homework, yes, sir.

MR. WHITE: Could we have the question read back?

(Record read as requested.)

MR. WHITE: That is with respect to the Harbor. I believe that was the other qualifying point.

MR. PHELAN: Right.

BY THE WITNESS:

A My recollection after reviewing the documents that were available at that time was that there was really no one document that I relied upon alone. There were several documents relating to sediment PCB levels available to me at that time. I will refer to them by number as they are in there.

MR. PHELAN: As in Brownell Exhibit No. 2.

BY THE WITNESS:

A I'm sorry, yes. WKIII 105.

BY MR. PHELAN:

Q Is that Arabic 3 or --

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A I'm sorry, WK II 105; WK II 111; WK III 102; WK III 119 and WK I 100, and those were the documents that I reviewed.

Q Did you rely on any other documents either in Brownell Exhibit No. 2 or otherwise, to your knowledge?

A No, there may well have been other documents. The best of my recollection, these were the main ones that I relied on with respect to that issue.

Q What document if any did you rely upon on which to conclude that PCBs that were found in the Harbor were mobile?

A Once again, I'd have to review the documents that were available to me. One that immediately comes to mind, however, or two are the two of which I have already mentioned, the WK II 105 which is the Argonne study, I believe, and the WK II 111, the mathematical modeling study by Dr. Thomann.

Q Incidentally, do you agree with all of the conclusions that Dr. Thomann makes in that particular document?

A I found it a reasonable scientific document, yes. I know his work, I have worked on projects alongside him before.

It seems a reasonable scientific document, given the data available to him, the data that I reviewed.

Q But do you agree with the conclusions that he makes?

A I find no fault with the conclusions.

Q Do you agree with them?

A I think they are reasonable and scientific conclusions, given the data he had available to him.

Q You are not going to answer my question?

A I find it a good document and I find no reason to suspect there is any error in it.

Q I could have said all that but I still could have agreed with his conclusions or disagreed.

Do you agree or disagree?

A They seem to be reasonable conclusions.

Q You are not going to answer the question do you agree or not agree with the conclusions?

A Given the data that is available and that I am aware that he worked with, they seem to be reasonable conclusions and I have no reason to disagree with them.

Q You agree with them?

A I guess I would agree with them. I don't

disagree. I see no reason to disagree.

I would prefer phrasing my response that way, if that is allowed.

MR. WHITE: That is allowed.

BY MR. PHELAN:

Q You indicated there were concentrations of material found in fish. These are the elements that you took into account for consideration in the no-action conclusion you reached within the first two weeks after you met with the U.S. Attorneys.

What documents did you rely upon to conclude that the material was finding its way into the fish?

A Well, once again, I would have to look to be sure of the specific documents. There were a number of data sheets supplied from U.S. EPA and State sources that indicated PCBs in fish.

There was also reference made in the Thomann report about fish contamination, WK I 100, the U.S. EPA's contamination summary documents.

I have referred to other documents with fish contamination, so as with sediment, there were a number of other sources on which to rely to form that impression.

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Q As you sit here right now, you are unable to tell me all those documents that you relied upon to making the conclusion that there were concentrations of PCBs found in fish?

A Accepting that conclusion, there were a number of documents to say any one specific one had an effect, I would not be prepared to do that, no.

MR. WHITE: For the record, all the documents that he relied upon for the basis of his testimony and any conclusion or opinion that he has articulated in his testimony are in this index and are the documents provided to counsel a couple of weeks ago.

BY MR. PHELAN:

Q Are you telling me, Mr. Henningson, that the opinions you have given and were about to give are based exclusively on the documents that are contained in Brownell Deposition Exhibit No. 2?

A I can't say without qualification that that is true. There may be other documents that passed before me or I viewed or reviewed that stuck in my mind. But to the best of my knowledge, those are the major pertinent documents that were available to me as I passed through this judgment phase.

Q You see, what I am trying to do is I am trying

to find out the universe of documents you relied upon. It is unfair to me to say, "I relied on something and I can't remember," because then you can take the stand and testify and give an opinion and I can show you all these documents which you may or may not agree or disagree with, but you can say, "I relied on something else but I can't remember it."

A Yes, I understand the dilemma.

Q That is what I am trying to find out.

A Yes.

Q You are telling me the likelihood of all documents you relied on are contained in Exhibit No. 2?

A No, sir. I am not saying that I can give you all assurances that everything that led me to my impression is contained in Brownell Exhibit 2.

Q Do you want to think about that and the next time you come back, you can give me a list of documents you relied on?

A I think I have answered your question.

Q No, you haven't answered it.

MR. WHITE: I am not so sure I understand what the question is.

BY MR. PHELAN:

Q If you are willing to circumscribe your basis

to this document, that is fine. You can circumscribe it to anything you want.

I just want to know what it is that you are circumscribing it to. Now, you told me that this may not be the universe, Deposition Exhibit No. 2, is that right?

A To the best of my knowledge, those are the principal sources. There may be others, but I don't remember.

Q Fine, what are the other sources?

A At this point, I cannot give you a more detailed answer, sir.

Q I hope you put your thinking cap on and go back and look at your notes to see if there are any other sources and if so, identify them.

Otherwise, I am going to ask the Court to restrict your testimony to those sources which you have given me.

MR. WHITE: Fine, fine.

BY MR. PHELAN:

Q You understand what I am asking?

A Yes, sir.

Q If I were a scientist and you and I were doing an experiment and you say thus and so and I said what is

the basis and you said I remember some other documents, I wouldn't accept your conclusion, would I?

A I'm sorry. You will have to --

Q If you and I were working as scientists and I asked you what you based your opinion on and you said some other documents but I don't remember, I wouldn't accept that as a scientist, would I?

A You might if you had a respect for my history and background and I gave you my expert opinion, you might, sir.

Q Do you write articles without footnotes?

A It depends on the nature of the article. Yes, sir, some articles do not have footnotes.

Q I would appreciate it if you would attempt to make a list of those documents apart from Brownell Deposition Exhibit No. 2 that you have relied upon in your opinions, all right?

A Yes.

Q You mentioned four things as I recall in connection with your decision that no action should be taken or that the no-action option was not appropriate: One was the contamination, the extent of contamination in Waukegan Harbor; two was that that material was mobile; three was that it was found in fish; and four,

there was some catastrophic event which could take place that could cause that material to be disseminated.

Would you tell me what documents or what information led you to believe there was some catastrophic event?

A I can name a number that just on the basis of judgment, not on the basis of any scientific document, would lead me to those concerns. A barge could sink or become damaged in one of the slips, release a solvent which is heavier than water, go down and mix in with the sediments and cause a problem that does not exist today, the problem of disposing of PCBS that could make them more mobile. So those are items that I need no basis in a document.

Q Do you know if any barge has ever sunk in the Waukegan Harbor?

A No, I don't know the answer to that, sir.

Q Do you know whether any barge has ever had a spill from Waukegan Harbor?

A No, I don't.

Q Do you know whether any barge has ever been in the Upper Harbor?

A Yes. I think I know there are barges in the Upper Harbor. I have been to Waukegan Harbor and saw a

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dredge barge there.

I also remember a report, a document where a barge grounded in Slip 3 and disturbed sediments.

Q Where did you read the report that a barge grounded in Slip 3?

A I think one of the OMC water quality reports that I think indicated it might have been a reason for high PCB in the water column.

Q A barge grounded in Slip 3 and that might have been a reason why PCBs were in the water column?

A Yes, sir, to the best of my recollection, that is what it said, but that document I'm sure is available to you, sir.

Q Is that document in Brownell Exhibit 2?

A I can confirm. I am not positive, but I believe it is among the documents.

Q Would you confirm that?

A Sure.

Q What other catastrophic events are there that you consider important to your judgment?

A As I recall, wind tides or wind fluctuations build up a great deal of motion in the Harbor. A seiche could occur. These have been reported as

possible in Lake Michigan; those kinds of climatic events could cause substantial movement.

Q What weather reports have you reviewed or did you review to make that judgment?

A None, sir.

Q Do you know when the last seiche occurred in Waukegan Harbor?

A No, sir.

Q Do you know whether a seiche ever occurred in Waukegan Harbor?

A Sir, I am saying it is possible, but no, I don't know.

(Mr. Bruce Featherstone entered the deposition room.)

BY THE WITNESS:

A I don't know whether a seiche ever occurred in Waukegan Harbor.

BY MR. PHELAN:

Q What are the wind fluctuations in Waukegan Harbor that might cause sediments to move?

A The order of magnitude? I don't remember precisely, but on the order of several feet.

Q What types of winds and what must their velocity be in order to cause the sediment to move?

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A I don't have the answer to that question, sir.

Q Have you ever calculated that out?

A No, sir.

Q Have there ever been reports that sediments do move under excess wind fluctuation?

A Are you --

MR. WHITE: Is that question specific to Waukegan Harbor or generally?

MR. PHELAN: No, just generally.

BY THE WITNESS:

A Yes, sir. Storm-driven sediment movement is fairly well known, yes, sir.

BY MR. PHELAN:

Q What other catastrophic events besides seiches and wind fluctuations and barges?

A Other kinds of spills; a failure of a retaining wall bulkhead. One can theorize, as I'm sure you can do as I, one of the mechanisms that might result in a movement of sediment.

Q How many pounds of PCB in your opinion have moved from Slip No. 3 to the Lake in the last 15 years?

A How many pounds have moved in the last 15 years? Sir, I haven't made that calculation.

Q Can you give us any idea?

A No, sir.

Q Do you know if one pound has?

A Have I personally? I have no means other than reviewing the information of others which I believe to be reasonably scientific approaches to estimate those movements that seem reasonable and they are available and in all the documents I have mentioned.

Q Are you basically testifying from the documents then?

A That was -- the charge was not to do original research, sir, but to review available documents to assess whether we believe them to be reasonable and scientific studies and can serve as a basis for developing engineering alternatives to stabilize any movement, were it to occur.

Q Can you tell me what in your opinion the documents mean in terms of the amount of pounds of PCBs that have moved from Slip 3 to the Lake in the past 12 years?

(Ms. Roseann Oliver entered
the deposition room.)

BY THE WITNESS:

A I have not formulated an opinion to that question at this point, sir.

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BY MR. PHELAN:

Q Could it be as low as ten pounds a year?

A I have no basis to really say it is more.

You might get to the point where you might say it is more than a million and I might be able to answer you, but at this point, I have not made that calculation.

Q When are you going to make that calculation?

A It was not on my to-do list.

Q You don't think it is important to know to what extent PCBs are matriculating from Slip 3 to Lake Michigan?

A That has been estimated and I am accepting as a rule of thumb the estimates made by Thomann and others. They may be reasonable estimates. They may be more, may be somewhat less, but they seem to be reasonable estimates of that movement.

Q Have you read Dr. Thomann's deposition?

A No, sir.

Q Do you think it important to read it?

A No, sir.

Q You don't?

A No.

Q What if he changed his mind at his deposition on what was in his report?

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A I am not sure that in itself would be important. I would also have to know why he changed his mind, what kind of factors went into the fact that he may have answered in some way contrary to what was in his report, not simply the contrariness that would concern me. I would be more interested in the basis.

Q You don't care whether the facts change?

A Yes, sir, I do care. I do care if the facts changed. His report was written as our work was done on what was available to us at the time.

Q Do you know his deposition had been taken before you came back on board?

A No, I don't have any idea when his deposition was taken.

Q Did you inquire as to whether he had been examined about his opinions contained in his report?

A To the best of my recollection, no, sir.

Q You haven't read any of his deposition?

A That is correct.

Q So you don't know what he said?

A That's correct.

Q To the extent he changed his opinions or interpreted his opinions he gave in his report, that may or may not affect your opinion depending upon the

bases for his opinion?

MR. WHITE: Do you understand the question?

BY MR. PHELAN:

Q Do you understand my question?

A Could you repeat it, please?

Q The fact that he may or may not have changed some opinions that he held or some facts that he found, that which was reported in his deposition to the extent that occurred, that may or may not affect your opinion?

A I think it is a fair assessment it may or may not.

Q In any event, you would agree with me though you should read his deposition?

A No, sir, I don't necessarily feel that that follows.

Q Fine.

You said there were some other considerations about public health that entered into your judgment made in the two weeks after you met with the U.S. Attorney that no action was not an appropriate remedy, is that right?

A Yes, sir.

Q Upon what documents or upon whose statements did you rely in making the statement that public health

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was a consideration?

A That is not really based on a specific document. That is based on the fact that my, to use the term, exposure to PCB problems has occurred over several years.

In the course of that, of course, I have reviewed a vast array of documents dealing with PCBs. I am aware of health effects which are alleged which may or may not have been proven. There seems to be a great deal of controversy about whether there is sufficient information that it is of interest to me and forms a basis for having some concern for public health effects that should be part of my consideration in this case, although I am not an expert, I am certainly aware of those kinds of concerns.

Q Have you studied the results of the Yusho incident in Japan?

A I am aware of that, yes.

Q You are aware of the study?

A I have read a number of documents related to the Yusho incident.

Q What conclusions have you drawn?

A That there is considerable controversy over the effects demonstrated in that case.

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Q What is the controversy?

A Regarding significance of PCBs versus dibenzofurans versus -- what is the other compound, PCB -- I can't remember what it is, but there is a third compound which has been implicated as a possible toxic.

Q Do you have an opinion as to whether it is dibenzofurans which caused that condition or PCBs?

A No, sir.

Q Do you consider PCBs a carcinogen?

A I am aware that there is a substantial body of knowledge which presents concerns that PCB is a carcinogen. Your question is rather broad.

I guess I should ask you carcinogenic in what area: Humans, mice? I believe there is data showing it certainly causes cancer in animals to some degree, certainly.

Q Causes cancer in animals?

A That was my understanding that there are reports to that effect.

Q Have you read the medical and testing reports concerning the application of PCBs to experimental animals?

A I believe I have read some reports. I could

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not give you a specific item.

Q Is it your opinion that they conclude PCBs applied to experimental animals will produce cancer in those experimental animals?

A I am not sure that again is an area well-defined and broadly accepted.

Q I didn't ask you that.

A I do not have a firm opinion on that, sir. I think it is a possibility as with a number of other chemicals.

Q Do those articles hold that if PCBs are applied to experimental animals, they produce cancer?

A My recollection is there are articles reflecting scientific studies that indicate PCBs cause cancer in experimental animals, yes, sir. That is my recollection.

Q Do you know the names of the articles?

A No, sir, not off the top of my head. I can't give you those.

As I said, I have been involved in this for several years and I am giving impressions and memories and judgments.

Q Incidentally, has the United States Government found that PCBs are toxic substances?

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A PCBs are specifically listed in the Toxic Substance Control Act. I don't know the answer specifically to your question.

Q What other public health concerns are there that you were concerned about, Mr. Henningson, that caused you within two weeks of your meeting with the U.S. Attorneys to conclude that the no-action option was not appropriate?

A I think I covered that area. It was one of several areas that led to that feeling at that time.

Q Would your opinion be any different if you were told that less than ten pounds per year of PCBs had matriculated from Slip 3 to the Lake in the last 12 years?

A I think some of the concerns that I mentioned to you, particularly of the catastrophic release, would make that still an item of concern, even though maybe the day-to-day flux was considered reasonably small by others.

I would still have concern for factors that could cause much larger release.

Q You have concerns, we all have concerns. I am asking you whether it would change your opinion if it were a fact that less than ten pounds per year were

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transported from Slip 3 to the Lake?

A No, sir, I don't believe it would given the concern I have for catastrophic releases.

Q If I were to tell you that the fish in the near Harbor and in the outer Lake had shown to have no increase in the amount of PCBs in the last 10 or 12 years, and in fact in the outer Lake have gone down, would that cause you to change your opinion that the no-action remedy was inappropriate?

A Would you repeat your question, please?

Q Certainly.

If I told you that the fish, one of those bases for your judgment, that the concentration of PCBs in those fish in the outer Lake had actually gone down in the last 12 years and that those closer in had remained the same and dropped in some cases, would that cause you to change your opinion?

A It depends on what levels. It is too broad a question. I don't know what levels we are starting from and what we are dropping to and the rate of dropping. There are a number of reasons that PCBs drop and which could be independent of the presence in the Lake: The climatic conditions, how cold, how fast it moves in and out. It is too broad a question.

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Q Did you look into that?

A Into what?

Q What I just asked you. Did you look into those changes?

MR. SCHINK: Are you asking before he reached his conclusion within the first two weeks?

BY MR. PHELAN:

Q Did you look into that before you made your opinion?

A What changes are you speaking about?

Q What I just suggested to you, the changes in the fish went down.

A Did I -- yes, I have -- you mean in the first two weeks?

Q Yes, when you made these opinions.

MR. WHITE: All of these questions are based on the first two weeks. We haven't gotten beyond two weeks from your coming to our office.

BY THE WITNESS:

A I don't recollect clearly what documents I had available to me in that first two weeks on fish. There are a number of documents that discuss the decline, possible decline in fish levels. When I reviewed them exactly, I don't remember.

BY MR. PHELAN:

Q You could have had any documents you wanted, couldn't you?

A I presume so.

Q I mean Mr. White and Mr. Hynes didn't say you cannot read those documents and you can't read these?

A No.

Q They didn't say you couldn't go to the Library of Congress?

A No, sir.

Q You could get any information you wanted from any source, is that a fact?

A No. There were certain limitations. We weren't supposed to speak directly to the EPA, for example.

MR. WHITE: That's right, John. Good man.

(Brief discussion off the record.)

BY MR. PHELAN:

Q Did you ask to read any of the depositions of any of the experts in this case?

A To the best of my knowledge, no, sir.

Q Including Mason and Hanger?

A I don't recall making such a request, sir.

Q As you sit there now, do you think it might be important to your decision that no action was not an appropriate remedy to read those depositions?

A I have no reason to think that. As I said, the studies I have reviewed, I found would generally be sound scientific documents and sufficient to form the basis for my opinions.

Q Are you telling me that as far as you are concerned, your opinion, you are satisfied is okay even though you may not have read any of the depositions of any of the experts who have been taken in this case over the past four years?

A Yes, sir.

Q Have you now covered the bases for your opinion that the no-action remedy was not appropriate for Waukegan Harbor?

A In a general way, yes, sir.

Q In a general way?

A Well, at that period we were approaching it in a very general way.

Q Did you later approach it in a specific way?

A As time went by, of course we reread and read and went over this material more times.

Q If I ask you a series of questions now about

what happened later, you are going to give me different answers?

A Yes, sir. There were definitely times, although I can't recall specifically, when in the course of -- we got a new document in this week, it's different than what we had before and very specific items, we may have altered our impressions or thoughts about a different number this week as opposed to that week because we were essentially reviewing a historical record which accumulated over a long period of time, which changed with time, changed with procedures, so that our opinions did change from time to time, yes, sir.

Q Whatever you read later, it didn't change your opinion that you formulated within the first two weeks, did it?

A Although we continued to evaluate the no-action alternative, there was no reason to change our initial thinking that some action was warranted, yes, sir.

Q What did you do next after you had gone through this original thinking back at White Plains after you met with the U.S. Attorneys? What did you do next?

A We established some basic conceptual alternatives. We met with the U.S. Attorney about two weeks

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what happened later, you are going to give me different answers?

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Q What did you do next after you had gone through this original thinking back at White Plains after you met with the U.S. Attorneys? What did you do next?

A We established some basic conceptual alternatives. We met with the U.S. Attorney about two weeks

later as I said, told them that we felt --

Q Let me get the date and place and time.

A I don't have that precisely.

Q That will be in the time sheets that you are going to give Mr. White?

A Yes.

Q You met two weeks later?

A Yes.

Q Where?

A Approximately -- here again.

Q That would be sometime in May?

A I believe sometime in May, yes, sir.

Q That was your second visit. Who was present?

A Mr. Brownell and myself, Mr. White, Mr. Hynes -- who was there? There was someone else.

I can't recall.

Q Where did that meeting take place?

A In the office down the hall, same place.

Q How long did the meeting take?

A I believe there was another two or three-hour meeting, in that order.

Q Did you go anyplace else?

A Yes, sir. After we finished here, we discussed if it would be all right for us to go and see the

Waukegan area and we did view that.

Q What was discussed at this meeting?

A We generally outlined the alternatives that we were going to evaluate: No action, stabilization in place, a limited removal activity and a full scale -- and I am simplifying, oversimplifying -- possibly a full scale activity with removal on site and a full scale activity with disposal off site.

Q Did you make any notes at that meeting?

A I presume so.

Q Would you give those notes to Mr. White?

This is the early May meeting?

A The second meeting that I attended, yes, sir.

Q Can you generally tell us the content of discussions you had with Mr. White and Mr. Hynes that day?

A Well, we covered all those alternatives; that we would cover and start developing, Dick would start developing costs and very detailed information on what it would take to implement those alternatives and I would reflect upon the environmental benefits that might accrue from those alternatives.

I guess we also discussed at that point, we picked up another bundle at that point, so it was

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another accumulation of data we went over, we covered a little bit just so we were familiar with them.

Q Did you express any preference for any of the remedies including the no-action remedy at that time?

A I don't clearly recollect that we did select a preference at that time, no, sir.

Q Did you tell Mr. White or Mr. Hynes that you had already decided that the no-action remedy was inappropriate?

A I don't believe we did. I think we said we were still looking at it because there was more detail to come in.

Q So you went up to Waukegan Harbor?

A Yes, sir.

Q What did you find?

A It is a very attractive place.

Q How long did you stay there?

A About an hour at the environs.

Q What specific places did you see?

A We went to, and I can't remember the name, it is like the Harbor Club or the Squattern Club or the -- right as you drive in, like a country club restaurant, whatever, because we were told that there was a picture

there where they were dredging with an overview of the Harbor. And we went in and looked around, looked at some of these older pictures of the Harbor before it was moved around some, got an impression of the breakwaters and the uses by boats and we drove around and went to Larsen Marine, drove in, asked permission to walk around and look at their property at Slip 3 to get a firsthand idea of the drainage that was entering Slip 3; where the drains were.

Although we had seen it on maps, we had not really seen it on the nature of surfacial material whether paved or unpaved, the nature of the slope of the land. We spoke with Mr. Larsen about the historical dredging patterns to the best of his recollection. That's what we did there.

Then we drove, we were running very late again, to catch our plane, so we drove around the sewage treatment plant to take a look at the North Ditch area from their property. We realized time was rather constrained and we did not want, we thought it might get more involved and decided at that point in time, we would not go up and climb up on the tanks and look at the North Ditch, so we just turned around and came back.

Q What did you do next?

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MR. WHITE: Got on the plane, right?

BY THE WITNESS:

A Got on the plane, drove down there to the airport, had a hot dog and soda and got on the plane.

BY MR. PHELAN:

Q What did you do next on this matter?

A We entered into what might be called the more substantial stage of evaluations, which was a process whereby Mr. Brownell would develop in greater detail, engineering alternatives and I would reflect back and forth with him in an interitive way, my impressions of whether that would result in greater benefit or lesser benefit; maybe we should put a slurry wall here and not put a slurry wall here, not from an engineering standpoint but from what the environmental benefits might be.

Q How did you decide to divide up the analysis of the project given you by the U.S. Attorneys?

A It actually fell out very simply because I work with Mr. Brownell this way all the time.

He does the engineering and is responsible charge for engineering and I am responsible charge for the work of the environmental scientists for the support for those kind of engineering considerations.

It was a natural breakout of work characteristic of what we had done in the past.

Q So you were the expert on the environment and he was the expert on how to do it?

A On the remedial measures, yes, sir.

Q An engineer's aspect?

A Yes, sir.

Q You returned back to White Plains and then what did you do?

A For the next several weeks, we worked on refining our alternatives and what the benefits of those alternatives might be.

Q What did you view at that point as the environmental benefits of whatever it was that Mr. Brownell would come up with in terms of an option?

A Means of reducing the mobility, means of possibly reducing the volatility. Those were the principal concerns we would reflect on and also assure that certain action might not make something worse, rather than better.

Q So your concern with mobility and volatility --

A Basically the environmental pathways and, of course, how that leads into the fish and so on.

Q What was the volatility problem as you viewed

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it?

MR. WHITE: Volatility problem where?

MR. PHELAN: Waukegan Harbor.

BY THE WITNESS:

A In the Harbor precisely, having gone through an analysis on the impact statement for the Upper Hudson, I am somewhat familiar with the kinds of approaches that one can take to do the volatilization of PCBs. They are very similar approaches that have been taken by others in other reports.

We looked at the volatility. It seemed to be more of a problem from a standpoint of contribution to the atmosphere as a whole rather than public health question based on the water quality levels that we saw, because it is a direct reflection of water quality levels and we are going on levels that appear on the data that we have, somewhat less than 10 parts per million.

BY MR. PHELAN:

Q Why don't you define for us how you use the term volatility.

A That PCB material which leaves the water and enters the air.

Q Go ahead.

A And it seemed to be more of -- the end judgment was it seemed to be more of a problem from a standpoint of overall loss to the environment over time as opposed to a public health effect, though we did not have data that showed what the monitored air levels would be.

Q Let me see if I understand.

A Just calculations.

Q After you examined the data and had been there, it was your impression at this point in time that volatility, at least presently, was not a problem; that is the amount of PCBs escaping into the air?

A No, sir, not as a direct result of just going there and viewing it.

Q I said based on your review of data, right?

A We did not, that was not a principal volatility from a standpoint of being a health hazard to people walking around the Slip, whatever, was not, did not seem to merit a lot of concern.

Q And the only problem you foresaw was one that might occur over a long period of time?

A Just that it is another pathway by which PCBs enter the environment, yes, sir.

Q You found no evidence to indicate to you

any present danger connected with PCBs being a health factor to humans by way of volatility?

A I was not aware of any evidence one way or the other, no, sir.

Q One way or the other?

A Yes.

Q Didn't you just tell me that as far as --

A Calculations we made, it appeared that based on the water levels available to us, that the subsequent levels in the air, concentrations, I should say, in the air did not appear to represent a health hazard, but we had no data to go on.

Q Simple calculations told you that they weren't a danger?

A That they were below the levels that normally are thresholds of concern.

Q So your concern from an environmental standpoint was mobility of PCBs in terms of volatilization?

A Once again, I have to say based on the water quality data available to us. We might have had another judgment if there were higher numbers in the water column.

Q Set aside the volatilization for the moment. The principal concern of you at that point in terms of

the environment was the mobilization of the PCBs within the Harbor to the Lake and I assume to the fish?

A Well, we're mixing apples and oranges here. We're on volatilization. I was concerned about that mobilization, yes. I was also concerned about the mobilization of the material, either carried through sediment transport or dissolved PCBs out to the Lake. I was also concerned with the fact there were contaminated sediments and very early on, we were concerned about the need to dredge the sediments at some future date and who would bear the burden of disposing of those contaminated sediments.

Q Follow me. You are saying that mobilization by volatilization as you saw it in your analysis in your preparation was not of concern to you?

A No, sir, I did not say that.

Q Mobilization --

A I did not say that.

MR. WHITE: He did not say that.

BY THE WITNESS:

A (Continuing.) No, sir. I said I was concerned with the overall mobilization to the environment. I said I did not find levels that concerned me.

BY MR. PHELAN:

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Q I said mobilization by volatilization was not of concern to you.

A I did not say that, no, sir.

Q You did not say that?

A I did not.

Q I may be missing something. The volatilization of PCBs into the air column there at Waukegan Harbor did not reach levels, based on your calculations, that were in the danger level?

A To public health for those people in the immediate vicinity of the water surface, or I should say, talking, walking around, running, et cetera.

Q So what you were focusing on was the movement of these PCBs from the Harbor or Slip 3 into the Lake?

A No, sir. I was also concerned with the mobilization in the area as a mass, not the concentrations, but the mass. That becomes another source of PCBs into the environment.

Q A mass in the air -- I don't follow you.

How did you conjure up that that could occur?

A Once you have a concentration of total mass that goes into the air and that can be pounds per year, that is another pathway by which PCBs enter the

environment, a major pathway.

Q In all the data that you reviewed in all the years that PCBs have been in Waukegan Harbor, has there ever been any report that there was a danger to public health from PCBs in the air, either at Waukegan Harbor, the Upland, parking lot or OMC's property?

A I am not aware of such a report, sir.

Q But you were really concerned with movement of these PCBs in the sediment through the water out to the Lake or out to the fish. Isn't that what you were concerned with?

A That was one of several concerns that still remain in our minds.

Q What are the other concerns?

A Once again, the mobilization of PCB into the air column as a mass transfer and therefore becoming part of the total environmental contamination problem.

Q Let us talk about the mobilization of the water.

What was it that concerned you as an environmentalist? What evidence did you see that there had been this mobilization?

A The distribution of PCBs in the Harbor, the

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distribution of PCBs in the Lake.

Q Let me stop you there.

What was the basis for your concern that there had been mobilization of the PCBs into the Harbor and into the Lake?

A The PCBs were not limited to the area of the original outfall. Clearly they had dispersed, by what mechanism, there could be many, but they clearly did not just stay there. They had moved in several directions.

Q What percentages did you estimate were actually in Slip 3 in 1982 when you were there?

A I did not make any such calculations as to the total poundage. That was more germane to how many pounds were going to be removed and how many cubic yards, et cetera.

Q You weren't concerned with what percentage was there?

A I did not make such a calculation.

Q In your opinion, is there 50 percent of these that were originally there still there?

A I did not form an opinion.

Q 80 percent?

A I did not form an opinion.

Q 90 percent?

A No, sir, I have no opinion.

MR. WHITE: He answered your question.

BY MR. PHELAN:

Q You weren't concerned that maybe as much as 95 percent was still there in Slip No. 3?

A I must say that my concern was not so much how much was there, but that it was in concentrations which could affect the water column and could become mobile.

Q That is not what I asked you, Mr. Henningson.

A Yes, I understand your question.

Q My question is did it make any difference to you, to your concern as an environmentalist, that 95 percent of the PCBs that were allegedly there in Slip 3 still remained there?

A I am sorry. Let me think about this question, think it through.

You are asking did it ever --

MR. WHITE: Do you understand the question?

THE WITNESS: I believe I do. Did I have any concern with the fact that most, you are saying that most of the PCB remained there. Did that cause me any basis for concern?

A I didn't use the information in that way, sir.

Q How did you use it?

A I used, I reviewed the work of others and judged whether I believed it was a reasonable approach to detect or predict the movement of PCBs out of the Harbor. I found no reason to disagree with the approaches used and the findings.

Q Did you agree with them?

A I had no reason to disagree with them. I found them to be reasonable scientific findings.

Q I asked you now whether you agreed with those findings that you say now apparently support your own conclusions.

A I'm not sure I did say they support my own conclusions there.

I found them acceptable, yes, and I did use them and rely upon them for my judgments, yes, sir.

Q I take it from your answers to these questions that you would have much preferred to have made all those tests yourself and conducted the original investigations yourself?

A Not necessarily.

Q You mean you wouldn't have cared if you got the contract back in 1978 or '79, whatever it was?

BY MR. PHELAN:

Q 95 percent, yes.

A It gives me moment to pause in that obviously there is a reservoir of PCB that is available for mobilization to the environment, both by catastrophic means and by slow release.

Q Do you know when the first PCBs allegedly went into Slip 3?

A Not precisely. It was in the late '50s, I believe.

Q Is it important for you to know how long they have allegedly been there?

A For certain operations, yes, sir. It might be important.

Q I mean if they had only been there for a year, that 5 percent had left there, that would be important to you, wouldn't it?

A In certain calculations, yes, sir.

Q Of course it would, wouldn't it? That means in one year 5 percent had left Slip 3.

A I am not sure where we are going here. Let me say --

Q It doesn't matter where we are going. Just answer the question.

MR. WHITE: He's answered the question.

MR. PHELAN: No, he didn't.

THE WITNESS: Would you repeat the question?

BY MR. PHELAN:

Q I am asking you if it would be of any importance as an environmentalist to know that all of the PCBs allegedly accumulated there within one year and now there was only 95 percent there.

A That might be of importance.

Q It would be equally important to know when the first PCBs were allegedly put into Slip 3, wouldn't it?

A It depends on what the purpose of your interest is, sir, and for certain interests, yes, it would be important. So if you want to know --

Q Was it or was it not important to you to know when they first got there?

A In some cases it did play a role, yes, sir.

Q What cases?

A The filling in of Slip No. 2, for example. I had a concern that PCBs might have ended up in Slip No. 2 and there was no data on that item, but I found that Slip No. 2 was filled prior to '57. It relieved some of my concern that PCBs might have ended up there

as well, so yes, the date was important.

Q When according to your information did the first PCBs accumulate in Slip No. 3?

A I really don't have a precise date of when it may have accumulated there. All we have is the use of PCBs to my knowledge at OMC and presumably, that is when it started.

Q When was it?

A In '57, I believe, late '50s.

Q These studies that you have relied on as far as we are concerned, right now, they are all here in Deposition Exhibit No. 2. Did they afford you as a scientist enough information to determine the pattern of movement if there was any movement from Slip 3 out into the Harbor, these PCBs?

A I did not make any such independent determination, sir. I reviewed the movement mechanisms that were developed by others.

Q That is not what I asked you. Did that information in this document that we have called Brownell Deposition Exhibit No. 2, give you sufficient information to convince you that you could see a pattern of how these PCBs had mobilized and left Slip No. 3 and been transported into the Harbor?

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A I did not interpret your question to be one of an economic benefit.

Q I didn't suggest that it was.

A My answer stands: Not necessarily.

Q It doesn't matter to you whether you agree with the people that wrote these other reports that did the original investigation or not in terms of your own opinion?

A I have already said I did rely upon them as a basis for judgment and the reasonableness of the alternatives and what benefits might accrue.

Q Are there any other environmental concerns that you were thinking about in your interfacing with Mr. Brownell other than about the mobility of PCBs in the sediments and in the Harbor and in the other areas, of course, at OMC?

A I think I come back to the principal concerns with mobility in and out of the Harbor, the bioaccumulation in fish, the contamination of the dredged material or potential dredged material on who is going to pay to have that disposed of in the future and the potential for catastrophic release beyond day-to-day release that might occur due to daily occurrences, so what we have is a refinement and a reflection upon whether a certain

action would or would not affect in a substantial way what is envisioned now.

Q What evidence did you find in any of these documents that led you to conclude that PCBs in Waukegan Harbor had found their way into the fish in Lake Michigan?

A I believe in my judgments, in reviewing the data, the high levels in fish in the Harbor are strong indication which I would then say is a direct relationship between PCBs in the Harbor and PCBs in those fish.

Q What data is that?

A There are a number of EPA fish sampling reports and fish and wildlife fish sampling reports in that document which indicate high levels in bass, carp and yellow perch.

Q On that basis, you have concluded that PCBs in the Harbor found their way into the fish?

A I would find that to be the most likely source, yes, sir, and I am reasonably certain that that is the most likely source, yes.

Q In Brownell Exhibit No. 2, can you tell me where that information is found?

A It will take some time, but yes, I can find it.

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MR. PHELAN: Why don't we take a break and you can look at that.

(Brief recess.)

(Mr. Jeffrey Fort entered the deposition room.)

MR. PHELAN: Do you want to repeat the question for Mr. Henningson, please.

(Question read.)

BY THE WITNESS:

A I had quite a number of resources available and to review and I will give you that list: WK II 103 and 112 -- I will tell you when I change Roman numerals.

WK III 103, 104, 106, 107, 114, 118, 118A;

Roman Numeral IV 99, 100, 101, 104, 117 --

I'm sorry, it changed numbers now.

V 117, 119, 126, 115 -- out of order --

122, 123, 124.

Of these the most pertinent appears to be WK IV 99.

BY MR. PHELAN:

Q IV, is that Roman V?

A That's Roman IV, No. 99.

Q That is the most pertinent?

A All of them played a part and there may be

others that I would want to be able to pull apart.

99 is simply a summary of a lot of the others.

Q If you will turn to that Roman Numeral IV 99 --

A I don't have the document with me.

Q Can you tell me the author of that document?

A No, sir.

Q Do you know what that document is a draft of?

A No, sir, I don't recall.

Q Do you know whether it has been revised?

A It said it was a draft in our summary here.

Whether it's been revised, I don't know. It is based on the data included in several other reports which I reviewed separately. It is a summary document. That is the only reason I pointed it out, that it is a summary document.

Q Incidentally, did you ever calculate the mass that might be mobilized by volatilization of PCBs?

A The mass?

Q Yes. You said earlier that you had a concern with volatilization because of the mass of PCBs. Did you ever calculate that?

A Yes, I did have staff look at that and make some calculations based upon the assumptions which I wanted to make and it came to on the order of 14 pounds

per year out of Waukegan Harbor.

Q That went into the air?

A That went into the air.

Q That would go out daily basis at the same rate?

A Our assumption was a uniform rate, yes, sir. There was some compensation, as I remember -- I must say that -- let me clarify this.

I did this with Dick Brownell. This was a shared effort and in fact he did have more of a role in the volatilization question than I at times, but we exchanged information.

Q To get this with a per second or per minute, I divide 365 days into 14 pounds?

A I am sorry, we came up with 14 pounds. We corrected then for ice cover which I believe brought it down to about 12 or thereabouts.

Q Divide 365 days and that gives me a quotient in a fraction of a pound per day?

A You could do it that way, yes, sir.

Q Then I further divide by number of hours?

A You could do it that way.

Q And then down to minutes and seconds?

A That would develop a number, yes.

Q Is that contained in any of your reports?

A Any of our reports?

Q Yes, the mass calculation.

A We don't have any reports. That was not a charge to us. I believe that there is a memo or a note which you have that has that approximation listed on there.

Q You don't know what that is offhand?

A It is a handwritten, one of the handwritten memos, I believe from Brownell.

It is a summary sheet by Brownell.

Q Incidentally, did you find that there were any benefits from a no-action option?

A I don't remember precisely coming to that conclusion, no.

Q Coming to what conclusion, that there was?

A That there were benefits of doing nothing. No, I don't remember coming to that assessment.

Q Are there?

A I would have to say that as with any assessment of impact, if one looks around enough, you can usually find something positive and the real importance here is what is the overwhelming result of that action or lack of action. And you have to weigh one against

the other.

So if I thought long and hard, I might be able to find benefits. I would doubt that they would outweigh or counterbalance to any substantial degree the negative aspects of doing nothing.

Q I asked in your opinion if there are any benefits.

A None that I thought of in the past.

Q Did you think about it?

A Not that I did in the past.

Q Did you think about it?

A No, not that I came up with in my thinking.

Q No, but did you think about whether there were any benefits? I am not asking you what you came up with.

A Did I, to put that backwards, did I say were there any benefits of doing nothing?

Q Yes.

A Yes.

Q And you concluded what?

A I couldn't think of any substantial benefits of doing nothing.

Q How about any benefits, substantial or otherwise?

A No, none that come to mind, even now, and we are still on the Harbor, is that correct?

Q Yes.

A Let me clarify that --

MR. WHITE: This is the Harbor question.

THE WITNESS: Yes.

BY MR. PHELAN:

Q You went back to White Plains after your second visit here and you began working on the options with Mr. Brownell. In terms of your own work versus the Government, what did you do next?

A My own work on a day-to-day basis with regard to this project?

Q When did you next see the U.S. Attorneys?

A When they came out to White Plains.

Q Which was when?

A I believe it was the 22nd -- 21st and 22nd of July.

Q Those two days?

A Yes, sir.

Q What did you do on those two days with the U.S. Attorneys?

A We discussed the alternatives that were developed, many of the kinds of things that we discussed

here today: The relative merits, what were the bases for doing anything as opposed to doing nothing.

Q Did you have completed the documents that have previously been marked as Brownell Exhibits 2 through 9?

MR. WHITE: Why don't you take a look.

THE WITNESS: I will have to look and see the dates.

To my knowledge, Brownell Deposition Exhibit 2 was completed at that time. I take that back. It was mostly completed. I think we added some items subsequent to that date, filled in some additional items and backup stuff which is in this copy but was not completely available at that meeting; specifically, the outputs that I had that I was looking at at that time with a possibility of migration from Slip No. 3 if it was filled and reviewing the fish levels which we have just discussed; other documents that you have which were not available at that time in this form.

They were either rough notes or in our heads, really. These documents were not available at the time before that. I am holding in my hands, I can give you the numbers: 7ID, 9ID, 3ID and 8ID.

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BY MR. PHELAN:

Q They were not available?

A They were not available though there may have been similar information in a different form, rough notes or something like that, but these formal documents were not available at that time.

Q What did you tell the U.S. Attorneys was your preference for --

A I am not sure I really did. I am not sure we did tell them we had a preference. What we were discussing there was a range of alternatives and the relative merits of what one might be over, as opposed to the other, why do anything at all, the same kinds of questions we have been discussing here.

Q You decided that no action was inappropriate again, didn't you?

A Yes. We felt fairly confident in our minds that that was appropriate, yes.

Q Did you tell them that at the time?

A I believe so, yes.

Q And of the other remedies, did you express any preference for any of them?

A Yes.

MR. WHITE: The question is did you personally.

THE WITNESS: At that time?

MR. WHITE: At that time?

MR. PHELAN: Yes.

BY THE WITNESS:

A I believe I did, I believe I did.

BY MR. PHELAN:

Q What preference did you express for any of the remedies?

A I think conceptually, the stabilization of the North Ditch area in place and the filling of Slip No. 3 with dredged material removed from other portions of the Harbor and the shutting off of Slip No. 3 and building an alternative slip to compensate for its loss.

Q When did you next see the U.S. Attorneys?

A Today. Today, sir.

Q Today?

A Yes.

Q You spent those two days then in July essentially going through these reports and discussing the remedies?

A I was only present on the first day actually. I met the Attorneys on Wednesday. I spent a little time with them, but the majority of my time was only on

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Thursday.

Q Have you brought any more documents with you today?

A I have here only the memos which I believe you have.

MR. WHITE: They don't already have that.

They have it as of this morning, that is the one you brought.

THE WITNESS: That is the only one.

MR. WHITE: I gave you that this morning.

BY MR. PHELAN:

Q This was not written to you -- or it was written to you, I am sorry.

(Henningson-OMC Deposition Exhibit
No. 2 marked for identification,
8/12/82, TLU.)

BY MR. PHELAN:

Q Of these documents, Exhibits 2 through 9 and Henningson Deposition Exhibit 2, which of these documents if any express your opinions concerning the environmental benefits to be obtained from the options that you have discussed with the U.S. Attorneys on July 21 and 22?

A I want to be accurate and when I reflect back,

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I want to be accurate on what I reflect back on.

(Brief pause.)

BY THE WITNESS:

A I am glad I did. My first impression was to say that these documents were designed with information to serve as a basis for an opinion and as I said before, we don't have a report that establishes that. I was going to say that none of the documents has a benefit specified and that is more a judgment in my head rather than something that has been written down.

However, the memo from Dick Brownell to me indicates some of his opinions which may be the only documentation I am aware of.

BY MR. PHELAN:

Q I was concerned with yours.

A I don't think that any of the documents directly specified that there would be a certain benefit from doing this as opposed to something else. I think they were really more development documents that lead to that and I don't think I come out and say that right away. That was not their intent. There is no final report, no final document.

Q As of today, August 12, 1982, do you have an opinion as to the type of remedy that ought to be used

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in the Waukegan Harbor and the parking lot and the North Ditch in Waukegan, Illinois?

A I in concert with Mr. Brownell worked on developing a range of alternatives. Each is feasible, each is reasonable and provides some improvement over what I understand and judge to be the existing conditions, so in that way any one of them would be beneficial. It is a matter of degree and that degree is in part a judgment that is out of my purview. What is an acceptable level, that is more out of my purview, what is an acceptable level. That is more than scientific judgment. That becomes a regulatory judgment, becomes a socio-economic judgment beyond my basis, really. All I can discuss are the range of alternatives and what the merits of any particular one might be as opposed to another by degree.

MR. PHELAN: Would you read him my question.

(Question read.)

BY THE WITNESS:

A You asked me earlier did I have a preference at that meeting.

BY MR. PHELAN:

Q That is what I asked you.

A Is that the same question, do I have a

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preference?

Q You just heard the question. Can you answer the question?

A I think there is a range of alternatives, the selection of which is not really up to me. I have a personal preference, but what ought to be implemented is really as much a regulatory decision as anything else.

Q So you have no opinion today as to which of the remedies or options that you have opined should be put in place?

A I have a preference, a personal professional preference for the stabilization in place at the North Ditch and the filling up of Slip 3.

Q Why are you reluctant to give an opinion, Mr. Henningson?

A I just told you what my preference was, but I don't deign that that is in my purview to say that that is what ought to be done.

There are other considerations beyond that of the sphere that I was asked to review this project.

Q What in your opinion has the most benefits from an environmental point of view of these remedies

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that you have reviewed?

A The single of all the remedies or collectively, are you focusing on one or in general?

Q Just the ones, all the ones you have outlined in these documents 1 through 9 and Henningson Exhibit 2.

A I think there are many benefits and I think I mentioned this before, but I think the one single benefit is that stabilization or removal will eliminate or at least substantially reduce the catastrophic loss that might be more costly and more difficult to account for sometime in the future.

Q Stabilization of the North Ditch?

A Yes. I admit I have gone into that area when we were in the Harbor, but yes, the alternatives can be thought of independently, but yes, I did include in that stabilization of the North Ditch.

Q Stabilization of the North Ditch and removal of PCBs from Slip 3?

A No, sir, filling in.

Q Sorry, filling in of Slip 3?

A Yes.

Q That is your opinion from an environmental standpoint?

A Yes, sir. I think that is a reasonable approach

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to take, given what I understand the environmental circumstances and benefits to be accrued.

Q Without regard to, as you say, the costs and without regard to other considerations?

A My environmental considerations, I would include a consideration of moving the material off site to some site 20 miles away as opposed to right there where there is apparent contamination already.

I have a personal preference not to contaminate some other potential area, so there are a number of factors that come into play and when I get into the various alternatives --

Q Is it your opinion today from an environmental standpoint which I understand you are qualified for and think you are qualified for that the most beneficial environmental way to handle the Waukegan problem is to stabilize the North Ditch and fill in Slip No. 3?

A No, sir. I don't believe that is what I said.

Q Fine, what did you say?

A I said that I have a personal preference for that alternative which is not necessarily the same as the one that will accrue the most benefits.

Q What will accrue the most benefits environ-

mentally?

A There you have to weigh one set of benefits against another. One would completely, as completely as possible excavate everything from the Harbor, not just from the Harbor, from the North Ditch, parking lot, lift up buildings and go there, do everything with a fine tooth comb and go off site somewhere and cause a great benefit in the Waukegan area and that would counterbalance a possible degradation of another area.

So there is a trade-off there between one benefit and the other, so the benefits to Waukegan Harbor would certainly be greater with that complete removal.

Q Are you able to answer my question?

A I thought I did.

Q What is the most environmentally efficacious option for Waukegan Harbor, the North Ditch and the parking lot?

A Could you explain the word efficacious?

Q Effective.

A Effective goes beyond environmentally. I think there is effective, if you want to know which one will derive the greatest benefit to the Waukegan

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Harbor area, I think I have answered that question.

Q What do you consider to be your expertise in this matter, Mr. Henningson?

A I am an ecologist. I have a broad understanding of most of the environmental factors that come into play in this sort of a process.

I have a background in biology, earth sciences, climatic sciences, and maybe just as important although not a registered engineer, have an understanding of engineering that allows me to deal with engineers in an effective way. That is the expertise I bring to this project.

Q So far as this Waukegan project is concerned, are you telling us that you merely have a preference and no opinion as to what ought to be done in Waukegan Harbor?

A Were it my decision --

Q That isn't what I am asking. You are not the Judge here.

A I am not trying to play games, really.

Q But you are.

I am asking you do you have an opinion. You claim you are a professional and you claim you have a certain expertise. Do you have an opinion or

do you simply have a preference?

A I have an opinion as to what alternative will have the greatest environmental benefit.

I have a preference for what in my own mind, given all the factors in addition to environmental factors that I am aware of, which I might do. Those are not necessarily the same. That is what I am trying to zero in on here.

Q I understand the word opinion and I understand the word preference. What is your opinion as to what ought to be done in Waukegan Harbor? I don't want your explanation of words.

A The stabilization of the North Ditch area and filling in of Slip No. 3 with material contaminated in the Harbor bottom from other areas as there is capacity within Slip No. 3 to do that.

(Mr. Bruce Featherstone left
the deposition room.)

BY MR. PHELAN:

Q Mr. Henningson, I'm going to show you what has been marked as Henningson Deposition Exhibit No. 2 for identification and ask you if you can identify that for us.

A Yes, sir. This is the memorandum which I

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caused to have prepared.

Q It consists of four pages and it is from M.J. Mann and S.A. Roberts.

A Yes, sir.

Q Dated August 6th.

What was the purpose of this memorandum?

A In the course of discussions with regard to the North Ditch, the issue of what would happen, the relative benefits that would occur to stabilize the North Ditch was a question to be looked at and especially in comparison with what the existing condition is. And I was endeavoring to document what the apparent existing condition was and then formulate an opinion as to what the results would be after that North Ditch area was stabilized.

(Mr. Hugh Thomas left the deposition room.)

BY MR. PHELAN:

Q Who are those persons, Messrs. Mann and Roberts?

A They are Malcolm Pirnie employees.

Q What is their field of expertise?

A Mr. Mann is an engineer. Mr. Roberts is a geologist.

Q These questions that began at Arabic 1 there, were those questions that you gave to them?

A Yes.

Q (Reading.) "To prepare for testimony on PCB remedial actions on Waukegan, we were asked to look at three aspects of the situation. Those were:

"a. Do previous estimates for surface water discharge from the North Ditch to the Lake consider only sediment transport or do they include a soluble component as well?"

Whose question is that?

A These are my questions. I wanted to clarify, I thought I knew the answer, but I wanted to clarify and it saved me some time for someone to verify my understanding.

Q What estimates were you talking about there?

A Well, there have been a number of estimates. They are summarized in the second page, Mason and Hanger and Hydroqual; others by JRB, which does not deal with the Ditch though.

Q What is the answer to that question?

A The answer is yes. At least the Hydroqual estimate which is not inconsistent with the others.

Q The second is, "Does the soluble PCB absorb" --

A Adsorb.

Q "...adsorb and then settle?"

What is the process of adsorb?

A It becomes attracted to soil particles in the water column and then they settle out and then it becomes associated with those particles during the quiescent condition.

Q What is the answer to that?

A There wasn't definitive information in the past although one might assume that might happen. It was difficult to come up with a number on that. It had not been measured directly.

Q The answer is uncertain?

A There is no documentation. I have my own thinking about it.

Actually what is missing from the question is if it did not account for it, in a., would it adsorb and then settle. There is reason to believe that.

My personal judgment is that, yes, PCB does enter the area and would adsorb and then may settle in soluble form. It will adsorb and then settle out, but to quantify it is impossible with the information available.

Q "What is the estimated effect of filling the North Ditch?"

A Once again, it was the only estimate we could prepare that was on a grams per day making a number of assumptions.

The net result is, I believe, that the net effect is it will not be a worsening and should be a benefit for a number of reasons.

Q The EPA overview report, what is the date of that or reference to that? That is contained in Brownell Deposition Exhibit No. 2.

A I'm sorry. I am not sure which report you are talking about.

Q In No. 2, it says, "The following reports were reviewed" --

A I believe, sir, my belief is that the EPA Overview Report is WK I 100. I would have to verify that by speaking directly to the person who wrote the memo, but that is my understanding at the time.

Q On Page 3 of Henningson Deposition Exhibit No. 2, the authors say:

"The big question coming out of this discussion is, 'Will the filling of the North Ditch actually make the problem worse in terms of total PCB

material discharged to the Lake?'"

The conclusion is that: "No, the situation will not be worse in terms of total PCB release. This is supported by the facts that," and it goes on.

Do you agree with that?

A Item A --

Q No, my question is do you agree with that.

A I agree with that.

Q You agree?

A Yes, sir.

Q Do you agree with the supporting reasons?

A I ended up not utilizing Item 6A in my judgment to any great extent. It makes some assumptions with regard to time in terms of annual rate of movement and there is insufficient data to define the annual groundwater underflow on an annual basis and that is what that assumption was. So with the exception of that item which is an assumption I would not have made, yes, I would agree with the supporting information. I am not saying I disagree with Item 6A. It just uses an assumption which I have chosen not to use as a basis for my thinking in that it assumes a continuous flow similar to some of the assumptions that are made in the other groundwater report, the JRB report.

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Q Before we get into this in any detail, will you tell me what you mean when you say stabilize the North Ditch area?

A In a general way, I am talking about filling the Ditch, regrading to reduce the inflow into the soil in that area; capping with a clay material and then covering with topsoil and grassing it.

So, a procedure that will reduce the infiltration and encourage drainage away from that contaminated area.

Q Would that be all the way from the eastern intersection with the Lake to the western delta?

A Pretty much, yes, sir.

Q There is a map, I think, attached to Deposition Exhibit 3, Page 40.

A I don't believe that this shows a stabilization alternative. I don't believe that is the correct alternative which I have been handed.

Q I am not suggesting it is. I am suggesting this is a map. Does that assist you in telling us the extent to which you would stabilize the North Ditch?

A Conceptually we would cover all the known contaminated areas and in fact, the parking lot areas as well. The exact boundary and extent may be redefined

somewhat in detailed design. Conceptually all existing contaminated areas and the parking lot would be covered.

Q The parking lots, what would you propose to do there?

A The whole area would have to be reworked and regraded. You couldn't leave the parking lot as it is, so the whole area would be regraded.

Q After you regraded it, what would you do?

A Once again, I am presenting this and I want to make it clear in a conceptual framework. I am not the design engineer involved in this. That is not my area of responsibility.

Q Whose area is that?

A That is Richard Brownell.

Q Is it your opinion that when you are saying, stabilizing the North Ditch, that it is necessary to do the parking lot that is shown there on the northern edge of the property?

A Mainly to ensure proper drainage control.

Q Is it essential?

A I believe it is an integral part of that alternative, yes, sir.

Q Do all of the parking lots at the north end need to be regraded and repaved and --

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A I am not in a position to make that judgment, sir. That is a design detail.

Q Can you give me some idea of the area that would be involved besides the North Ditch?

A To its greatest extent, it would be the North Ditch from its westernmost, including the Oval and Crescent Lagoons, from the westernmost end to the area just before it enters the Lake where contamination is known to occur and the parking lot, and the extent of grading really depends on the drainage factors, as I said.

Of course, that incorporates the bypass being built on the south end of the parking lot area so there is some tearing up of the parking lot as well.

Q On No. 6d, Page 3 of Henningson Deposition Exhibit No. 2 is, "Paving of the entire area will also minimize this discharge."

A Um-hmm, yes, sir.

Q Does that have reference to the same thing you have been talking about?

A Yes, sir, direct relationship to drainage. If the water does not drain off rapidly, it will percolate into the soil and so the regrading and the capping as I mentioned with impermeable material will

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minimize what goes through the contaminated areas. The capping is more important in the contaminated areas, but the grading is important throughout to be sure of proper draining.

Q The use of the word recharge here, how is that used?

A Precipitation coming directly onto the ground surface and percolating through the ground soil.

Q What is the recharge, percolating out through the soil?

A It becomes contribution to the groundwater.

Q I'm going to come back to that the next time we get together and I have had a chance to study this so we won't waste any time here.

Do you have a copy of Brownell Deposition Exhibit 3?

A From Mulligan to Brownell, yes, Brownell 3.

Q I take it you have read and reviewed this document?

A Yes, sir.

Q Does this in your opinion constitute Mr. Brownell's field of expertise or yours?

A Mr. Brownell's expertise in terms of the detailed material which it contains.

Q Have you any personal knowledge of any estimates of cost of designing, implementing those concepts that you have suggested?

A I don't understand the question, sir.

Q Do you --

A Clearly I have read the document. So --

MR. WHITE: Do you understand the question?

THE WITNESS: No, I don't understand the question.

MR. PHELAN: Would you read the question back.

(Question read.)

MR. WHITE: Do you understand the question?

THE WITNESS: Yes. Only what has been retained from reading through this.

BY MR. PHELAN:

Q Did you call any of the contractors or call any of the people that may or may not have quoted on this?

A No, sir.

Q In your experience, have you designed, overseen or inspected any facilities like those that you have suggested here?

A No, sir. This is not my area of expertise. It would not be my responsibility within the firm.

Q That is not my question. Have you observed

or inspected a facility that has been built as a result of your concepts?

A Could you explain to me --

Q Similar to these.

A Could you explain to me the meaning of the term inspected?

Q Just viewed and seen if it met the objectives that you thought it needed to meet.

A From a conceptual standpoint in terms of the potential environmental release, I am familiar with the techniques that are employed here. I have been on sites under construction, not with the responsibility for its correct construction. I have been there to familiarize myself with the techniques.

MR. PHELAN: Let us take a look at Brownell Deposition Exhibit No. 5. We can take a short break here and you can take a look at Exhibit 5 and we will start on that.

MR. WHITE: Take five minutes?

MR. PHELAN: Yes, five minutes. I will start with that when we come back.

(Brief recess.)

BY MR. PHELAN:

Q Did you take a look at Brownell Deposition

Exhibit No. 5, Mr. Henningson?

A Yes, sir.

Q Would you describe and identify for us Brownell Deposition Exhibit 5?

A This was in response to my request for an estimate of the movement of groundwater, possible movement of groundwater through Slip 3, were it filled with clean sand, were it filled with dredged material which was contaminated

Q What prompted you to have Mr. Roberts do such a study for you?

A This is one, given this as an alternative, I wanted to have some feel for what the possible resultant would be and weigh that against no action or some other alternative.

Once again, looking at the benefits of no action as opposed to taking some action, so this was derived to get at an estimate which I could then review and use as a basis, but not necessarily the only basis of my opinion as to what that impact might be.

Q What is the plan that you had conceived that would allow this sand in place in Slip No. 3?

A I would not want to, by myself, be thought of

as the sole author of this concept. It is at best a joint concept, so it is not necessarily a plan that I conceived of.

Q What would you do in Slip 3 under this plan?

A Under the plan which is identified, the slip as it stands today would be filled under one scenario with clean sand brought in from either outside the site or if possible, if they found suitable sand, the sand found on the vacant OMC property, the sand from the Harbor and that would be used as a blanket cover for the existing material in Slip 3.

Alternatively, one could instead of using relatively clean material, fill up that same place with contaminated material from the adjoining Harbor.

Q How would you seal off Slip 3 under this proposal?

A It is more of a structural seal, if you will, rather than an all-encompassing bathtub seal. That is not the intent here. It is mainly to stabilize it from movement, to weigh --

Q I understand that, but what would you do physically?

A It would be filled with the material.

Q Before you filled it, you did something else first, didn't you?

A Yes. You construct sheet piled wall, two sheet pile walls, fill it with sand between the existing bulkheads; fill it with sand, dig that out and replace that with a slurry wall.

There would be another sheet pile wall behind that and the intervening space would act as a settling basin -- I am sorry, there would just be the sheet pile wall -- no, there would be a settling basin. It would dredge it.

In the alternative of Scenario 2, they were conceiving as described in Brownell Exhibit 3 where you would be dredging, you would have a settling area between bulkheads as well, between sheet pile walls. Where you were only putting in clean sand, that would not be necessary because you are not moving contaminated material. You have to make a distinction, and I am not sure that this is entirely consistent with that. That precedes that and as I said, you think through this sort of thing and you modify your thoughts as you go along.

Q Let me see if we can put this together with Brownell Exhibit No. 9.

Do you have Brownell Deposition Exhibit
No. 9?

A Yes, sir.

Q Is that Mr. Brownell to you?

A Yes.

Q Now, what we are discussing now is the
Brownell Exhibit No. 5.

Which of the alternatives that is being
discussed in Brownell Deposition Exhibit No. 5 as shown
on Brownell Exhibit No. 9?

A There may not be a direct relationship. I
will have to identify those that come close.

I have to repeat that the data on this
is 8/5 and this is 7/21 and the thinking changes.
That is a very long time in the time frame we have
been talking about.

MR. WHITE: I told you they were just notes. I
tried to explain that to you. These are notes in aid
of testimony, not a final report or analysis.

BY MR. PHELAN:

Q What comes closest to it? You have 1b. It
is certainly not 1b and 1.

Is it 1b 2A, 1b 2B?

A If I could just read it. With Scenario No. 2 --

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Q Scenario No. 2 as shown on Deposition Exhibit 5?

A Comes closest. It appears to be b, Item 1b 2B.

Q Fill Slip 3 with Upper B1?

A And the Harbor. That is closest in concept to Scenario 2. None of these concepts in Exhibit 9 approximates Scenario No. 1 which was clean sand.

Q For the purposes of this examination, can we eliminate Scenario 1?

A I can consider Scenario 2 separately, yes, sir.

Q No, let me understand.

Brownell Exhibit No. 9 does not contain an option as in Scenario No. 1 is shown on Exhibit No. 5, does it?

A Brownell Exhibit No. 9 does not appear to include Scenario 1 from Brownell Exhibit 5.

Q Therefore, can I eliminate No. 1 as one of those options that you will not opinionize about but may have a preference?

MR. WHITE: Do you understand the question?

THE WITNESS: Yes, I do.

BY THE WITNESS:

A Well, No. 9 is Mr. Brownell's thinking at the

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time he wrote this memo. It does not include all the alternatives that I believe are shown in the more extensive Item 3 which has a list of, I believe, other alternatives as well, so they are not even exactly the same list. So to say you will eliminate it, one might at one time want to consider using clean sand -- yes, sure, we can do that, sure.

Q Wait. This memorandum, Brownell Exhibit 9, is dated August 5?

A Yes, sir.

Q Presumably that is the last word, Brownell Deposition Exhibit 3 is dated August 4. Are you telling me the one on August 4 is the more inclusive and therefore contains the universe of options that --

A Once again, none of these are a final report. I believe that is from Mr. Mulligan to Mr. Brownell.

This is from Mr. Brownell to me and they are not, our impressions and opinions are derived from this plus other information that is available and so there is no one document that I can point to and say that is the be-all and end-all.

Q Now we can throw all these out and start from scratch.

Why don't you start to list your options

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for me and then I will get into each one of them in detail.

A Well, I think I have from the standpoint that I would evaluate them which is not the same standpoint that one would cost out alternatives or do detail design. And I would simplify them in this way:

In the North Ditch area, one can stabilize, one can do nothing, no action. One can stabilize the North Ditch with filling and capping and regrading.

Q Filling, capping and regrading?

A Yes, sir.

One can remove the hotter areas down to some number which may be 500 or 50, so that is an option, or one can remove all the known PCB in the North Ditch area.

Q Are we including in the North Ditch, the parking lots?

A Where PCBs are known to occur, yes.

Q All of the parking lot?

A They are to my knowledge based on the information I have had available to me. There is not PCB under all the parking lot, so there is not an intensive grid system that would prove conclusively that there

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might not have to be removal if other information is derived, but at this point there is no need to remove the whole parking lot, yes, sir.

Q We are talking about some of the parking lot?

A Yes, sir.

Q When you are talking about the North Ditch area, you are referring to some of the parking lot.

What are the universe of options that you considered for the North Ditch other than doing nothing, stabilizing by filling, capping and regrading, removing some of the hotter spots and removal of all PCBs? Is that the universe of options?

A In the stabilization, of course, is the re-routing of the storm drainage. That is all that comes to mind at this point.

Q So essentially there are four options --

A Recognizing that one of them has variable degrees.

Q The removal of hot spots?

A Yes, sir.

Q Was that costed out?

A Yes, sir, I believe it was.

Q I would like you to tell me as a -- you prefer to be called an ecologist?

A I think that is my area of expertise, strongest area.

Q Then we are going to ask you for your ecological opinions here.

As an ecologist, what are the risks and what are the benefits of doing nothing in the North Ditch area? We will call that Option No. 1.

A The risks of doing nothing are the continued release through the Ditch system, through the surface water system of PCBs to the Lake, the volatilization of PCBs from the Ditch to the air, the possible catastrophic release of PCBs to the Lake as a result of the failure of one of the lagoons to the north of the sewage treatment plant; a blowout of one of the pipes that are along the south end of the treatment plant; a storm either coming in from the Lake or the Upland portion, upstream of the site of significant and unusual magnitude that will cause a greater flushing than occurs now.

Another risk is, or I prefer to use the term impact or non-benefit, is the limitations on the usefulness of that piece of property to the current owner or some future owner or for whatever purpose. Those are the ones that come readily to mind.

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Q What do you estimate is the amount of PCBs that are being released into the surface water and ultimately into Lake Michigan on a yearly basis?

A From the North Ditch?

Q The North Ditch, yes.

A My recollection is the estimates which I don't disagree with are on the order of 10 -- let me refer, just to make sure, the latest summary, I am looking at Henningson Deposition Exhibit No. 2:

The soluble fraction and storm flow on the order of 10 pounds per year on a daily day-to-day basis and due to storm-related, 1 to 10 pounds is basically what has been estimated. And that is the Hydroqual has slightly different numbers, but it is about the same thing, on the order of about 10 pounds per year on a steady state basis and maybe 10 pounds on storm-related events, so they are related to surface water movement.

Q Do you consider that to be a reasonable estimate of the amount of PCBs that are being discharged from the North Ditch area into the Lake and groundwater?

A The assumptions are reasonable and one could come up with higher estimates or possibly lower esti-

mates or other assumptions, but they appear to be reasonable.

Q Do you consider that to be a risk to the environment?

A Clearly it is a substantial input to the near-shore environment.

Q Do you consider that to be a substantial risk to the near-shore environment?

A It is equal to, roughly equal or slightly more depending on what number you accept to what is legal in the Harbor itself, so it is a substantial portion of the total loading coming out of the Waukegan area.

Q But do you consider that a substantial risk to the near-shore environment?

A I don't see any direct evidence to the fish that live there for the water quality levels that it is having a dramatic impact on the water quality on the fish in the near-shore environment.

Q Does there appear to be a substantial risk to the near-shore environment?

MR. WHITE: I think he just answered your question.

MR. PHELAN: I don't think he answered the question. I have now put it in terms of him as an ecologist.

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MR. WHITE: Can you answer the question?

THE WITNESS: Yes. Well, let me take a moment and see if I can put it in terms that may be more acceptable to you.

BY MR. PHELAN:

Q It is not a matter of acceptable terms to me.

My question is does the release of up to 10 pounds of PCBs over one year constitute, in your opinion, as an ecologist, a substantial risk to the near-shore environment of Waukegan Harbor?

A I think I have to respond in this way: Environmental impact from the true value of them or danger of them is a collective one and additively, they can be significant and substantial and it is difficult to take one by itself and say, well, this one is not important because collectively they are all important.

As an ecologist, that would be my opinion, yes, that it is important.

Q I'm going to certify this question and Mr. White can tell you later what it means, but would you repeat the question for him again, Thea, and I would ask you to answer my question, Mr. Henningson, about

whether you have or don't have an opinion. If you have an opinion, please state it.

Read the question, please.

(Question read.)

MR. WHITE: Now, if you can answer this question any more than you already have, if you have anything to add to it, go ahead and answer. If you cannot answer it any better than the manner that you have articulated already, that is the end of the question.

THE WITNESS: I realize the import of this question and I want to think about it for a moment, if I may.

(Brief pause.)

BY MR. PHELAN:

Q Are you ready, Mr. Witness?

A Yes, sir.

Q What is your answer?

A Read back the question, please.

(Question read.)

BY THE WITNESS:

A I believe the question is too broad and I could not answer it in a yes or no fashion. There are too many qualifiers that could be attached to it.

BY MR. PHELAN:

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Q Let me ask you this question:

Do you have an opinion based upon your experience and your education and within a reasonable degree of ecological certainty as to whether the discharge of 10 pounds of PCBs from the North Ditch of Waukegan Harbor area into the Lake through the surface water constitutes a substantial risk to the near-shore environment?

A I perceive it as the same question. I am sorry and I cannot answer.

Q The question calls only for a yes or no.

A I don't believe it is the nature of the question I can answer yes or no.

Q Mr. Witness, if you listen to the question, it says do you have an opinion. Now, either you do or you do not. If the answer is you don't, then you say you don't.

MR. WHITE: The witness has identified the problem with the question and indicated that he cannot answer yes or no.

MR. PHELAN: The question I just asked him -- read the question again, please.

(Question read.)

BY THE WITNESS:

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A I cannot answer that question as it is given to me with a yes or no answer. It is too complex. You cannot look at that source separately.

BY MR. PHELAN:

Q Are you stating you have no opinion?

A No, sir.

Q You have an opinion?

A I am saying that I cannot answer that.

Oh, wait a minute. Do I have an opinion?

Q That's right.

A Yes, with regard to --

Q Yes.

A Read the question back.

(Question reread.)

BY THE WITNESS:

A In concert with other discharges that have been proposed, yes, I have an opinion.

MR. PHELAN: I ask the questions, you give the answers. You don't seem to believe that that is the way in which we proceed.

BY MR. PHELAN:

Q Can you answer the question as framed?

A The opinion is not independent of other considerations.

Q I just asked you if you have an opinion. I didn't ask you what the opinion was. I asked you if you had an opinion.

A And I have to qualify to make it clear for the record which is only paper that my opinion is qualified by a relationship to other discharges.

Q Then your answer is you have an opinion?

A With that qualification, yes, sir.

Q Listen to the question and is your answer, "I have an opinion"?

(Question read.)

BY THE WITNESS:

A As it relates to discharges, in that area, yes, I have an opinion.

BY MR. PHELAN:

Q I don't care what your opinion is. Do you have an opinion? That is the only question I asked.

A I believe I answered the question to the best of my ability.

Q No, you didn't. You are going to take forever and I am going to stay here forever. And I am a very persistent fellow.

The question is do you have an opinion --

A I believe I answered.

Q You tell me in concert with other opinions, you have an opinion?

A Yes.

Q So you are telling me you have an opinion?

A In concert with other discharges.

Q But you have an opinion?

A I believe I answered the question.

Q Do you have an opinion?

MR. WHITE: He answered the question, Dick.

BY MR. PHELAN:

Q Now, give us your opinion.

A I did answer that once, but I will say it again, that it is difficult to separate one discharge such as this and say that it does or does not pose a substantial risk because by that, in that approach, one can say, one by one, eliminate all discharges that are toxic to the environment and maybe individually they were not -- not that I am saying this one was not, but my opinion is that you have to view something like this in concert with other nearby discharges and what the collective effect will be.

And I think any ecologist will support me in that opinion. You cannot take it independently.

Q Let me add this to my hypothetical. Do you

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have an opinion based upon your experience and training and within a reasonable degree of ecological certainty that if you have two discharges into Lake Michigan on an annual basis of 10 pounds per year each, that those two discharges constitute again, in your opinion, a substantial risk to the near-shore environment?

A It substantially increases the risk that were to occur were there no discharges at all.

Q Obviously you like the game of semantics.

MR. WHITE: That is your characterization, Mr. Phelan.

MR. PHELAN: It is true and I think it is absolutely true. That is all the witness is doing is playing with words.

BY MR. PHELAN:

Q Do you have an opinion based on your experience and training and within a reasonable degree of ecological certainty as to whether two discharges of 10 pounds of PCBs on an annual basis through the surface water system into Lake Michigan constitutes a substantial risk to the environment and the public health?

A For one thing, I am not an expert in public

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health, and I am not prepared to even begin to address that issue in terms of risk.

I have some familiarity with it, but I am not an expert in public health and I believe I once again have answered that from the standpoint that risk assessment has to start from some base line and the risk of two discharges of 10 pounds apiece represents a substantial departure from zero.

In that way, it is a substantial increase in the risk of some effect to the near-shore environment.

MR. PHELAN: Okay. See you on the 13th of September.

MR. WHITE: Thank you. Your pleasure, the 13th, 14th and 15th?

MR. PHELAN: At least.

(At 4:20 o'clock p.m., the deposition was adjourned to be resumed on September 13, 1982, at 10:00 o'clock a.m.)

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Q Had you agreed at that meeting to do something on the Waukegan Harbor Project?

A Once again, I believe that it was an expression of interest. It was more whether we were not certain at that point whether the U.S. Attorney had accepted our interest, so we let them know that we wanted to do the work and felt there could be an accommodation.

I don't remember being told we are on board or something specific like that at that time.

Q What if anything else did you do while you were here in Chicago?

A I think that was a real whirlwind back to the airport and got a hot dog as we jumped over suitcases and got on a plane. There was no other contact on that trip.

Q Did you visit Waukegan Harbor on that trip?

A I don't believe so.

Q Did you visit Waukegan Harbor on any trip?

A Not on that trip, no, sir.

Q Did you talk to Mr. Larsen on that trip?

A Not that trip, to the best of my recollection, no, sir.

Q You only met with Sandra Gardebring and the

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U.S. Attorneys, Hynes and White, at that time?

A I really did not meet. I --

Q Just past her?

A She introduced herself because we had talked on the phone and then excused herself.

Q Did you make any notes at that meeting?

A I presume so, though I don't recall precisely.

Q Did you discuss any remedies at that meeting?

A If we did, it was only in the generalest of sense.

Q Do you have any notes of that meeting?

A With me? No, sir.

Q Would you send those notes to Mr. White so we can look at those in the interim and discuss it with you?

MR. WHITE: If you have the notes, send them to me.

BY MR. PHELAN:

Q Do you have any notes?

A I took notes. Whether I still have them or not, I'm not sure. I may have.

Q The next thing you did then was you returned to White Plains and what did you do in White Plains about the Waukegan Harbor Project?

A We discussed how we might be able to consider

a range of alternatives quite objectively. Oh, I remember one precise item that did transpire at that meeting and we tried, we did clarify what the ground rules of any work we would produce would be in that were we constrained by anything other than it would be based on available information. And we were not to assume that any previous work would constrain us or any regulatory limits would constrain us as well. We were told to be totally objective as to what were the reasonable alternatives.

I think that was an important output in that meeting, so we went back and discussed what we could provide in that framework, what kind of range of alternatives.

We were told it was a very short time frame, a few weeks to maybe two months at the outside to do a balance of technical work, so that limited us in the range we might be able to look at.

Q Did you feel that you would have preferred to have more time?

A I have no reason to think that that affects the work product that we produced. We are used to working under tight time constraints from other clients as well. It is a very common requirement of our work.

Q When you first sat down and discussed this with Mr. Brownell back in White Plains, were there any other persons present at your meeting back there?

A Sir, I don't recall precisely. It is possible, yes, sir.

Q Tell us your thought process at that time. What were the remedies you began thinking about?

A Well, that range is I think fairly straightforward. You leave it in place and you don't do anything; you stabilize it in place in some way; you take it out and put it in a site, possibly more secure nearby or on the OMC site, or you take it out and put it off in the boonies somewhere in a thoroughly designed containment site.

That is the kind of range we discussed and tried to refine.

Q Did you just think about burning them up?

A I am not sure whether incineration really fell into it at that time. I guess it did, yes, sir. We thought about it at that time; I think so.

Q Was it your thought at that time that you were not to determine whether something should be done but rather what should be done?

MR. WHITE: This is the initial meeting after

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they leave Chicago?

BY MR. PHELAN:

Q After you leave Chicago and are back in White Plains.

A And what we're discussing?

I would say that you're asking were we supposed to make a judgment as to a recommendation, specific recommendation to do this and no, that was not my understanding. We were asked what kinds of things could be done.

Q No, no. Was it your understanding of your mission, your project that you were to decide what were the available options to do something, or was your mission to decide whether anything ought to be done?

A I think both. A review of the basic data to gain an understanding of the extent of the problem if one exists and then to come up with appropriate remedies which would really be matched to the amount of environmental improvement that could be achieved or the amount of environmental change that had occurred.

Q Let me ask you on the first order: The first question that you addressed was whether anything should be done?

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A I wouldn't say that we addressed it in that fashion. I think we recognized it was a broad assignment to look at all three.

Q Wouldn't that be the logical place to begin?

A It certainly is a part of the thinking process, development processes, yes.

Q If you decide nothing should be done, there is no point in discussing the remedies.

A I wouldn't say we spent a lot of time discussing whether something should be done and how we would go about determining that other than reviewing the information to determine what the level of contamination was.

It wasn't a question of whether there was PCB in Waukegan Harbor in my mind at that time.

I'm not sure I understand your question.

Q You were satisfied there were PCBs there in Waukegan Harbor?

A I guess at that time, I felt confident.

Q No one denied that, that you know of, anyway?

A No, sir.

Q Did you seriously consider whether anything ought to be done?

A In the course of our investigations, yes, we

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did.

Q You didn't start there though?

A What we did was have a framework where we could telescope what we were doing to meet the time frame, so we were doing a number of things at one time.

Q I understand.

A One of which was the no-action alternative, and then to answer your question, yes, we did absolutely consider doing nothing and something needed to be done and that was one of the actions we considered.

Q What was the consideration you took into account in considering whether anything should be done?

A Well, that really relates to a judgment of -- okay, I can answer this.

You want to know why in our judgment might we reach a decision, a judgment that something or anything should be done, and I would say at this point that there are a number of reasons why action, some action should be taken.

And I think I do feel that no action is inappropriate.

Q What are the considerations that went into your thinking that no action was not an appropriate

remedy?

A That there is contamination; that there is information which indicates that material is mobile in the environment. There is information that indicates that fish have taken up that material and have levels of PCBs above what are considered acceptable levels; that there is a potential for catastrophic release of those materials above the day-to-day steady state condition that one can expect.

Those are the things that we thought mostly in those early discussions. Other things may have come up later, but those were the kinds of things, plus the regulatory constraints themselves which we were not charged as making as a limit to our thinking, but that was in there, too.

Q First, that there was contamination; second, you had information to believe the contamination was mobile?

A Yes, sir.

Q Third, the fish apparently had either consumed some of that material or you had information that they had.

A Yes.

Q Fourthly, that some catastrophic event --

A To move it, sure, regulatory concerns. I would add to that, the whole concern for health effects which are ill-defined. That is another area that one might consider.

There are a number of things beyond even what Pirnie would consider.

Q Let us get into that.

What are some of these concerns that are somewhat vague in your mind that went into this?

A They were not vague in my mind. I would say there are uncertainties about a degree of hazard from a public health standpoint which always is a concern in this sort of activity. So to that extent, that would have a bearing on my thinking, even though it is not as precise as some other areas.

Q Let me go back to the first one. Is all contamination of PCBs in your opinion that which requires some remedial action?

MR. WHITE: All contamination of PCBs?

MR. PHELAN: Require some action.

MR. WHITE: Well, I object to the question as being overly broad, indefinite.

Do you understand the question?

THE WITNESS: Oh, I understand it.

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BY MR. PHELAN:

Q Good.

MR. WHITE: Then answer it.

BY THE WITNESS:

A I think you have to know to what degree and what we are talking about, where it is, how mobile.

BY MR. PHELAN:

Q You will not accept that premise as a general premise that all PCB contamination should be remedied?

A No, sir.

Q Fine.

Now, having accepted that premise, what did you learn about the extent of contamination at Waukegan Harbor?

A I would like to clarify. Are we in this meeting in White Plains or --

Q This is your original thinking, right.

A These were in generalities. I don't think I can go beyond those kinds of generalities at that meeting at this point. That is pretty much the kinds of things that should fall in our thinking as we develop alternatives.

Q Are you telling me, Mr. Henningson, at no time before you began this elaborate analysis of options

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and remedies did you give serious thought to no-action remedy?

A It was done concurrently with the alternatives. We did not have the time to do an exhaustive analysis of the no-action. We wanted to do it concurrently and come up with the alternatives and then let it shake out.

Q You would agree with me though that given no time constraints whatsoever, the logical place to begin is whether you should do anything?

A That was -- will you repeat it?

Q Yes. Given the time constraints, isn't the time to begin whether you should begin anything and not what you should do?

A The identification of the extent of the problem is the first step in the process, so yes, sir.

Q So you would agree with my premise? If you had no time constraints, you would have decided --

A And that was our charge, to go through that step by step process as to whether there was something that needed to be done or not.

Q Wasn't that your charge?

A That was not our only charge.

Q Did you start off on the assumption that something had to be done?